AUTHORIZED DOCUMENTATION

Installation Guide

Novell®
Open Enterprise Server

2 SP2

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Contents

About This Guide

This guide describes how to install, upgrade, and update Novell® Open Enterprise Server (OES) 2 SP2 Linux. Except where specifically stated, the content of this guide applies to installing OES on a computer's physical hardware rather than on a Xen* virtual machine host server.

Audience

This guide is intended for system administrators.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation, or go to www.novell.com/documentation/feedback.html and enter your comments there.

Documentation Updates

The latest version of the *OES 2 SP2: Installation Guide* is available at the Open Enterprise Server 2 documentation Web site (http://www.novell.com/documentation/oes2/inst_oes_lx/data/front.html).

Additional Documentation

Table 1 *Additional Documentation References*

For more information about	See
Planning and implementing OES 2 SP2	*OES 2 SP2: Planning and Implementation Guide*
Migration from and coexistence with other products	"Different Migration Tools" in the *OES 2 SP2: Migration Tool Administration Guide*
Installing OES 2 SP2 on a Xen Virtual Host Server	Chapter 10, "Installing, Upgrading, or Updating OES on a Xen-based VM," on page 179
SLES 10 Installation and Administration details	*SUSE® LINUX Enterprise Server 10 Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/book_sle_reference.html)

Documentation Conventions

In this documentation, a greater-than symbol (>) is used to separate actions within a step and items within a cross-reference path.

A trademark symbol (®, ™, etc.) denotes a Novell trademark. An asterisk (*) denotes a third-party trademark.

When a single pathname can be written with a backslash for some platforms, or a forward slash for other platforms, the pathname is presented with a forward slash to reflect the Linux convention. Users of platforms that require a backslash, such as Linux* or UNIX*, should use backslashes as required by the software.

1 What's New in the OES 2 Install

This section summarizes the features that have been updated with each release of Novell® Open Enterprise Server (OES) 2 Linux.

- Section 1.1, "What's New in the OES 2 SP2 Install," on page 13
- Section 1.2, "What's New in the OES 2 SP1 Install," on page 13
- Section 1.3, "What's New in the OES 2 Install," on page 14

1.1 What's New in the OES 2 SP2 Install

The following features were added or modified from the SP1 release installation:

Table 1-1 *OES 2 SP2 Release*

Functionality	For More Information About
Create an EVMS Based Proposal	In the YaST install, an option is available to automatically create an EVMS based proposal for the system device. See Section A.2, "Configuring the System Device to Use EVMS," on page 214.
Upgrade through the Patch Channel	You can now upgrade an OES 2 SP1 server to OES 2 SP2 through the update (patch) channel. See Section 5.4.5, "Upgrading Using the Patch Channel (Online)," on page 122.

1.2 What's New in the OES 2 SP1 Install

The following features were added or modified from the initial release installation:

Table 1-2 *OES 2 SP2 Release*

Functionality	For More Information About
Unsupported packages are no longer removed by default.	Installing OES 2 while installing SLES 10 SP1: See "Specifying the Add-On Product Installation Information" on page 47. Installing OES 2 services on a server that is already running SLES 10 SP1: See "Installing/Configuring OES 2 SP2 on an Existing Server" on page 107.
OES servers are now configured to use eDirectory certificates for all HTTPS services by default in every installation/upgrade scenario except an upgrade from OES2, wherein the option used during the initial server install/upgrade is retained.	Certificate management in OES2, see "Certificate Management" in the *OES 2 SP2: Planning and Implementation Guide*.

Functionality	For More Information About
Updating through the Novell patch channels now requires registering the server with the Novell Customer Center using either purchased activation codes or 60-day evaluation codes.	This change is reflected in various instructions throughout this and other guides.

1.3 What's New in the OES 2 Install

In the initial release of OES 2, the following features were added to the OES installation:

Table 1-3 *OES 2 Initial Release*

Functionality	For More Information About
Open Enterprise Server 2 Linux is an add-on product that can be installed with SUSE® Linux Enterprise Server 10 SP1 or added to a server running SLES 10 SP1 with updates.	Installing OES 2 while installing SLES 10 SP1: See "Specifying the Add-On Product Installation Information" on page 47. Installing OES 2 services on a server that is already running SLES 10 SP1: See "Installing/Configuring OES 2 SP2 on an Existing Server" on page 107.
DVD media is now also available to perform the installation.	See "Preparing Physical Media for a New Server Installation or an Upgrade" on page 42.
OES 2 can be installed on x86-64 bit hardware.	See Table 2-1 on page 17.
Configuring OES services is easier to find and perform on multiple services.	See "Configuring Novell Open Enterprise Server Services" on page 70 and "Installing/Configuring OES 2 SP2 on an Existing Server" on page 107.
A specific tool for extending the schema is available in YaST.	See "Extending the Schema" on page 26.
You can install OES 2 Linux on a Xen-based virtual machine host server.	See "Chapter 10, "Installing, Upgrading, or Updating OES on a Xen-based VM," on page 179."
You can install OES 2 Linux as a Xen-based virtual machine host server.	See "Chapter 9, "Installing OES as a Xen VM Host Server," on page 177."
The method for updating OES matches the method for updating SLES 10 SP1.	"Updating (Patching) an OES 2 SP2 Server" on page 149.

Preparing to Install OES 2 SP2

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You should also perform the tasks and understand the information outlined in the following sections:

2.1 Before You Install

Before you install Novell® Open Enterprise Server (OES) 2 SP1 Linux, you should review the information in the following sections:

- ❑ “Planning Your OES 2 Implementation” in the *OES 2 SP2: Planning and Implementation Guide*
- ❑ “Before You Install or Upgrade” in the *OES 2 SP2: Readme*

2.2 32-Bit Vs. 64-Bit

OES 2 and SLES 10 are available in both 32-bit (i386) and 64-bit (x86_64) architectural versions.

2.2.1 64-Bit eDirectory

Selecting *Novell eDirectory* when using

- OES 2 SP2 64-bit media automatically installs 64-bit eDirectory™.
- OES 2 SP2 32-bit media installs 32-bit eDirectory.

2.2.2 64-Bit NCP Server

Selecting *NCP Server* when using

- OES 2 SP2 64-bit media, automatically installs 64-bit NCP™ server.
- OES 2 SP2 32-bit media installs 32-bit NCP server.

2.2.3 Matching Software with Server Hardware

Make sure that you understand which software can be installed on which server hardware.

- **64-Bit Server Hardware:** Supports either the 32-bit versions of OES and SLES or the 64-bit versions of OES and SLES.
- **32-Bit Server Hardware:** Supports only the 32-bit versions of OES and SLES.

2.2.4 Don't Mix 32-Bit and 64-Bit OES and SLES

The 32-bit and 64-bit versions of OES and SLES are not compatible with each other. In other words, you cannot install 32-bit OES with 64-bit SLES on the same server hardware, and the reverse is also true.

2.3 Meeting All Server Software and Hardware Requirements

Before installing OES 2 SP2, ensure that your system meets the following requirements.

- Section 2.3.1, "Server Software," on page 16
- Section 2.3.2, "Server Hardware," on page 17

2.3.1 Server Software

As part of the OES 2 SP2 installation, you install SUSE® Linux Enterprise Server 10 SP2.

IMPORTANT: OES 2 SP2 services were developed and tested on a default SLES 10 SP3 server base.

As you install OES 2 SP2, do not change any of the SLES 10 Base Technologies package selections, such as Java support. Doing so can cause various problems, such as the installation failing or one or more OES 2 SP2 services not working properly.

If you are installing on an existing SLES 10 SP3 server, be sure to verify that all of the default SLES 10 SP3 components are installed before attempting to install OES 2 SP2 services.

2.3.2 Server Hardware

Table 2-1 *Server Hardware Requirements*

System Component	Minimum Requirements	Recommended Requirements
Computer	Server-class computer with Pentium* II or AMD* K7 450 MHz processor	Server-class computer with Pentium III, Pentium III Xeon*, Pentium 4, Intel* Xeon 700 MHz, AMD K8 CPUs (Athlon64 and Opteron*), Intel EM64T or higher processor. **NOTE:** Some OES services run in 32-bit mode only.
Memory	1 GB of RAM	2 GB of RAM for base system. Additional RAM might be required depending on which OES components are selected and how they are used.
Free Disk Space	7 GB of available, unpartitioned disk space	10 GB of available, unpartitioned disk space. Additional disk space might be required, depending on which OES components are selected and how they are used.
CD-ROM or DVD Drive	4X CD-ROM or DVD drive if installing from physical media	48X CD-ROM or DVD drive if installing from physical media
Hard Drive	20 GB	
Network Board	Ethernet 100 Mbps	
IP address	◆ One IP Address on a subnet ◆ Subnet mask ◆ Default gateway	
Mouse	N/A	USB or PS/2
Server computer BIOS	Using a CD-ROM or DVD installation source, prepare the BIOS on your server computer so that it boots from the CD-ROM or DVD drive first.	
Video Card and Monitor	1024 X 768 resolution or higher with a minimum color depth of 8 bits (256 colors)	**NOTE:** Although it is technically possible to run the ncurses installation at a lower resolution, some informational messages, etc. aren't displayed because text strings don't wrap to the constraints of the window.

NOTE: The RAM and disk space amounts shown here are for system components only. The OES service components you install might require additional RAM and disk space.

Be sure to complete the planning instructions found in the *OES 2 SP2: Planning and Implementation Guide* for each component you install.

2.4 eDirectory Rights Needed for Installing OES

The following eDirectory rights are discussed in this section:

2.4.1 Rights to Install the First OES Server in a Tree

To install an OES server in a tree you must have rights to extend the schema, meaning that you need Supervisor rights to the [Root] of the tree.

You can extend the schema by using the Novell Schema Tool in YaST or by having a user with Supervisor rights to the [Root] of the eDirectory tree install the first OES server and the first instance of each OES service that will be used into the tree. For more information, see Section 2.6.4, "Extending the Schema," on page 26.

2.4.2 Rights to Install the First Three Servers in an eDirectory Tree

If you are installing the server into a new tree, the Admin user that is created during the OES installation has full rights to the root of the tree. Using the account for user Admin allows the installer to extend the eDirectory schema for OES as necessary. To install the first OES server in an eDirectory tree, you must have the Supervisor right at the [Root] of the eDirectory tree.

2.4.3 Rights to Install the First Three Servers in any eDirectory Partition

By default, the first three servers installed in an eDirectory partition automatically receive a replica of that partition. To install a server into a partition that does not already contain three replica servers, the user must have either the Supervisor right at the [Root] of the tree or the Supervisor right to the container in which the server holding the partition resides.

2.4.4 Rights to Run Deployment Manager

If you are installing the first OES server into an existing NetWare eDirectory tree, you can run Deployment Manager first to prepare the tree so it is compatible with the new version of eDirectory that comes with OES 2 SP1 and later. This requires access to a server with a Read/Write replica of the Root partition.

2.5 Installing OES As a Subcontainer Administrator

IMPORTANT: The information explained in Section 2.4, "eDirectory Rights Needed for Installing OES," on page 18 is prerequisite to the information contained in this section.

This section outlines the eDirectory rights required and explains how a subcontainer administrator approaches various installation tasks.

- Section 2.5.1, "Rights Required for Subcontainer Administrators," on page 19
- Section 2.5.2, "Starting a New Installation As a Subcontainer Administrator," on page 21
- Section 2.5.3, "Adding/Configuring OES Services As a Different Administrator," on page 21

2.5.1 Rights Required for Subcontainer Administrators

For security reasons, you might want to create one or more subcontainer administrators (administrators that are in a container that is subordinate to the container that user Admin is in) with sufficient rights to install additional OES servers, without granting them full rights to the entire tree.

A subcontainer administrator needs the rights listed in Table 2-2 to install an OES server into the tree.

These rights are typically granted by placing all administrative users in a Group or Role in eDirectory, and then assigning the rights to the Group or Role. Sample steps for assigning the rights to a single subcontainer administrator are provided as a general guide.

Table 2-2 *Subcontainer Administrator Rights Needed to Install*

Rights Needed	Sample Steps to Follow
Supervisor right to itself	1. In iManager > *View Objects* > the *Browse* tab, browse to and select the sub container administrator. 2. Click the administrator object, then select *Modify Trustees*. 3. Click the *Assigned Rights* link for the administrator object. 4. For the *[All Attributes Rights]* property, select *Supervisor*, then click *Done* > *OK*.
Supervisor right to the container where the server will be installed	1. Browse to the container where the subcontainer administrator will install the server. 2. Click the container object and select *Modify Trustees*. 3. Click *Add Trustee*, browse to and select the subcontainer administrator, then click *OK*. 4. Click the *Assigned Rights* link for the administrator object. 5. For the *[All Attributes Rights]* and *[Entry rights]* properties, select *Supervisor*, then click *Done* > *OK* > *OK*.

Rights Needed	Sample Steps to Follow
Supervisor right to the W0 object located inside the KAP object in the Security container	1. Browse to *Security* > *KAP*. 2. In *KAP* click *W0* and select *Modify Trustees*. 3. Click *Add Trustee*, browse to and select the subcontainer administrator, then click *OK*. 4. Click the *Assigned Rights* link for the administrator object. 5. For the *[All Attributes Rights]* and *[Entry rights]* properties, select *Supervisor*, then click *Done* > *OK* > *OK*.
Supervisor right to the Security container when installing the NMAS™ login methods	If the subcontainer administrator will install the NMAS login methods, do the following: 1. Browse to and select *Security* 2. Select *Modify Trustees*. 3. Click *Add Trustee*, browse to and select the subcontainer administrator, then click *OK*. 4. Click the *Assigned Rights* link for the administrator object. 5. For the *[All Attributes Rights]* and *[Entry rights]* properties, select *Supervisor*, then click *Done* > *OK* > *OK*.
Create right to its own container (context)	1. Browse to and select the container where you created the subcontainer administrator. 2. Select *Modify Trustees*. 3. Click *Add Trustee*, browse to and select the subcontainer administrator, then click *OK*. 4. Click the *Assigned Rights* link for the administrator object. 5. For the *[Entry Rights]* property, select *Create*, then click *Done* > *OK* > *OK*.
Create right to the container where the UNIX Config object is located.	1. Browse to and select the container where the *UNIX Config* object is located. By default this is the Organization object. 2. Select *Modify Trustees*. 3. Click *Add Trustee*, browse to and select the subcontainer administrator, then click *OK*. 4. Click the *Assigned Rights* link for the administrator object. 5. For the *[Entry Rights]* property, select *Create*, then click *Done* > *OK* > *OK*.
Read right to the Security container object for the eDirectory tree	This is not needed if the Supervisor right was assigned because of NMAS. If the subcontainer administrator won't install the NMAS login methods, do the following: 1. Browse to and select *Security* 2. Select *Modify Trustees*. 3. Click *Add Trustee*, browse to and select the subcontainer administrator, then click *OK*. 4. Click the *Assigned Rights* link for the administrator object. 5. For the *[All Attributes Rights]* property, select *Read*, then click *Done* > *OK* > *OK*.

Rights Needed	Sample Steps to Follow
Read right to the NDSPKI:Private Key attribute on the Organizational CA object (located in the Security container)	1. Browse to *Security* and select the Organizational CA object. 2. Select *Modify Trustees*. 3. Click *Add Trustee*, browse to and select the subcontainer administrator, then click *OK*. 4. Click the *Assigned Rights* link for the administrator object. 5. Click the *Add Property* button. 6. Select *NDSPKI:Private Key* and click *OK*. The *Read* right should be automatically assigned. 7. Click *Done* > *OK* > *OK*.
Read and Write rights to the UNIX Config object.	1. Browse to and select the *UNIX Config* object. 2. Select *Modify Trustees*. 3. Click *Add Trustee*, browse to and select the subcontainer administrator, then click *OK*. 4. Click the Assigned Rights link for the administrator object. 5. For the *[All Attributes Rights]* property, select *Write* (*Read* is already selected), then click *Done* > *OK* > *OK*.

When installing DNS/DHCP into an existing tree with DNS/DHCP, see the following additional guidelines:

- For DNS, see "eDirectory Permissions " in the *OES 2 SP2: Novell DNS/DHCP Administration Guide for Linux*.
- For DHCP, see "eDirectory Permissions " in the *OES 2 SP2: Novell DNS/DHCP Administration Guide for Linux*.

2.5.2 Starting a New Installation As a Subcontainer Administrator

You can install a new OES server into an existing tree as a subcontainer administrator if you have:

- The rights described in "Rights Required for Subcontainer Administrators" on page 19
- (If applicable) The rights described for the server installations described in "eDirectory Rights Needed for Installing OES" on page 18.

When you reach the eDirectory Configuration - Existing Tree page, enter your fully-distinguished name (FDN) and password. After verifying your credentials, the installation will proceed normally.

2.5.3 Adding/Configuring OES Services As a Different Administrator

You can add or configure OES services on an OES server that another administrator installed if you have the rights described in "Rights Required for Subcontainer Administrators" on page 19.

Do the following:

1. On the OES server, launch YaST. Then click *Open Enterprise Server > OES Install and Configuration*.
2. On the Software Selection page, select the additional OES services you want to install, then click *Accept*.

   The required packages are installed.
3. When the Novell Open Enterprise Server Configuration summary screen appears, click the *disabled* link under *LDAP Configuration for Open Enterprise Services*.

   The link changes to *enabled*.
4. Click *LDAP Configuration for Open Enterprise Services*.
5. Change the Admin Name and Context.

   IMPORTANT: Make sure all field delimiters are consistent. For example, if you are adding to the context already displayed, either use comma-delimited syntax or change all other delimiters to periods.
6. Type the subcontainer admin password in the *Admin Password* field, then click *Next*.
7. Continue with the service installation, modifying service configuration parameters as needed. For example, skip to Step 7 on page 109 and continue from there.

2.6 Preparing eDirectory for OES 2 SP2

2.6.1 If Your Directory Tree Is Earlier than eDirectory 8.6

If you are installing an OES 2 server into an eDirectory tree that is earlier than eDirectory 8.6, do the following before installing your first OES server in an existing NetWare tree:

1. Extend the schema using Deployment Manager. See “Schema Update” in the *NW65 SP8: Installation Guide*.
2. Ensure that the schema is synchronized throughout the tree from [ROOT] by doing the following:

   2a Verify that schema is synchronizing out from [ROOT] by entering the following commands at the System Console prompt of the NetWare server with the Master of [ROOT]:

   ```
   set DSTRACE=on
   set DSTRACE=nodebug
   set DSTRACE=+Schema
   set DSTRACE=*SSD
   set DSTRACE=*SSA
   ```

2b Toggle to the Directory Services screen and look for the message: `All Processed = YES`

2c On each server that holds a Master of a partition, enter the following commands at the System Console prompt:

```
set DSTRACE=off
set DSTRACE=nodebug
set DSTRACE=+Schema
set DSTRACE=*SS
```

2d Toggle to the Directory Services screen and look for the message: `All Processed = YES`

2.6.2 If Your LDAP Server Is Running NetWare 6.5 SP2 or earlier

If you are installing into an eDirectory tree that is using a NetWare server to supply LDAP, upgrade the LDAP server that the OES installation will communicate with to the NetWare 6.5 SP3 or later software. A server running NetWare 6.5 SP2 or earlier will probably abend.

2.6.3 If Your Tree Has Ever Contained an OES 1 Linux Server with LUM and NSS Installed

Having NSS volumes on OES servers requires certain system-level modifications, most of which are automatic. For more information, see "System User and Group Management in OES 2 SP2" in the *OES 2 SP2: Planning and Implementation Guide*

NetStorage, X-Tier, and Their System Users

By default, certain OES services, such as NetStorage, rely on a background Novell service named X-Tier.

To run on an OES server, X-Tier requires two system-created users (named `novlxsrvd` and `novlxregd`) and one system-created group that the users belong to (named `novlxtier`).

An NSS Complication

These users and their group are created on the local system when X-Tier is installed. For example, they are created when you install NetStorage, and their respective UIDs and GID are used to establish ownership of the service's directories and files.

For NetStorage to run, these X-Tier users and group must be able to read data on all volume types that exist on the OES server.

As long as the server only has Linux traditional file systems, such as Ext3 and Reiser, NetStorage runs fine.

However, if the server has NSS volumes, an additional requirement is introduced. NSS data can only be accessed by eDirectory™ users. Consequently, the local X-Tier users can't access NSS data, and NetStorage can't run properly.

eDirectory Solves the Basic Problem

Therefore, when NSS volumes are created on the server, the X-Tier users are moved to eDirectory and enabled for Linux User Management (LUM). (See "Linux User Management: Access to Linux for eDirectory Users" in the *OES 2 SP2: Planning and Implementation Guide*.).

After the move to eDirectory, they can function as both eDirectory and POSIX users, and they no longer exist on the local system.

ID Mismatches on OES 1

Problems with OES 1 occurred when additional OES NetStorage servers with NSS volumes were installed in the same eDirectory container. Because the UIDs and GID were assigned by the system, unless the installation process was exactly the same for each OES 1 server, the UIDs and GID didn't match server-to-server.

When the local X-Tier UIDs and GID on subsequently installed servers didn't match the X-Tier UIDs and GID in eDirectory, NetStorage couldn't access the NSS volumes on the server.

The OES 1 Solution—the nssid.sh Script

To solve this problem, the OES 1 installation program looked for X-Tier ID conflicts, and if the IDs on a newly installed server didn't match the IDs in eDirectory, the program generated a script file named `nssid.sh`. The documentation instructed installers to always check for an `nssid.sh` file on a newly installed server, and if the file was found, to run it. The `nssid.sh` script synchronized all of the X-Tier IDs with those in eDirectory.

This solution remained viable through the first release of OES 2.

OES 2 SP1 and SP2 Require a New Approach

Unfortunately, system-level changes in SUSE Linux Enterprise Server 10 SP2 and later invalidate the `nssid.sh` script solution. Synchronizing the X-Tier IDs with an OES 1 installation can now cause instability in other non-OES components. Therefore, starting with OES 2 SP1, you should standardize all X-Tier IDs on existing servers before installing a new server with X-Tier-dependent services.

The OES 2 Solution—Standardizing the UIDs on all OES servers

If your eDirectory tree has ever contained an OES 1 Linux server with NSS and LUM installed, do the following on each server (including OES 2) that has NSS and LUM installed:

1 Log in as root and open a terminal prompt. Then type the following commands:

```
id novlxregd
```

```
id novlxsrvd
```

The standardized X-Tier IDs are UID 81 for `novlxregd`, UID 82 for `novlxsrvd`, and GID 81 for `novlxtier`.

2 If you see the following ID information, the X-Tier IDs are standardized and you can move to the next server:

```
uid=81(novlxregd) gid=81(novlxtier) groups=81(novlxtier)
uid=82(novlxsrvd) gid=81(novlxtier) groups=81(novlxtier),8(www)
```

If you see different IDs than those listed above, such as 101, 102, 103, etc., record the numbers for both X-Tier users and the novlxtier group. You need these to standardize the IDs on the server.

Continue with Step 3.

3 Download the following script file:

- fix_xtier_ids.sh (http://www.novell.com/documentation/oes2/scripts/fix_xtier_ids.sh)

4 Customize the template file by replacing the angle bracketed variables (<>) as follows:

- **<server_name>:** The name of the server object in eDirectory.

  Replace this variable with the server name.

  For example, if the server name is myserver, replace <server_name> with myserver so that the line in the settings section of the script reads

  ```
  server=myserver
  ```

- **<context>:** This is the context of the X-Tier user and group objects.

  Replace this variable with the fully distinguished name of the context where the objects reside.

  For example, if the objects are an Organizational Unit object named servers, replace ou=servers,o=company.

- **<admin fdn>:** The full context of an eDirectory admin user, such as the Tree Admin, who has rights to modify the X-Tier user and group objects.

  Replace this variable with the admin name and context, specified using comma-delimited syntax.

  For example, if the tree admin is in an Organization container named company, the full context is cn=admin,o=company and the line in settings section of the script reads

  ```
  admin_fdn="cn=admin,o=company"
  ```

- **<novlxregd_uid>:** This is the UID that the system assigned to the local `novlxregd` user. It might or might not be the same on each server, depending on whether the `nssid.sh` script ran successfully.

  Replace this variable with the UID reported for the novlxregd user on this server as listed when you ran the commands in Step 1 on page 24.

  In the example script, the original UID is 101. It gets changed to 81 in the third line of the script. The sixth line changes the UID on all of the files and directories on the server that are owned by the novlxregd user from 101 to 81.

- **<novlxsrvd_uid>:** This is the UID that the system assigned to the local `novlxsrvd` user. It might or might not be the same on each server, depending on whether the `nssid.sh` script ran successfully.

Replace this variable with the UID reported for the novlxsrvd user on this server as listed when you ran the commands in Step 1 on page 24.

In the example script, the original UID is 103. It gets changed to 82 in the fourth line of the script. The seventh line changes the UID on all of the files and directories on the server that are owned by the `novlxsrvd` user from 103 to 82.

- **<novlxtier_gid>:** This is the GID that the system assigned to the local `novlxtier` group. It might or might not be the same on each server, depending on whether the `nssid.sh` script ran successfully.

  Replace this variable with the GID reported for the novlxtier group on this server as listed when you ran the commands in Step 1 on page 24.

  In the example script, the original GID is 101. It gets changed to 81 in the second line of the script. The six and sevenths lines change the GID from 101 to 81 for all of the files and directories on the server that are owned by the `novlxtier` group.

5 Make the script executable and then run it on the server.

IMPORTANT: Changes to the X-Tier files are not reported on the terminal.

Error messages are reported, but you can safely ignore them. The script scans the entire file system, and some files are locked because the system is running.

---

6 Repeat from Step 1 for each of the other servers in the same context.

2.6.4 Extending the Schema

An eDirectory tree must have its schema extended to accommodate OES 2 servers and services as explained in the following sections.

Who Can Extend the Schema?

Only an administrator with the Supervisor right at the [Root] of an eDirectory tree can extend the tree's schema.

Which OES 2 SP2 Services Require a Schema Extension?

The following service schema extensions are included with OES 2 SP2.

A single asterisk (*) indicates a service that is either required for OES 2 servers or for the default services that are installed on every OES 2 server. They are implemented when the first OES 2 SP1 or later server is installed in the tree.

Unmarked extensions are implemented the first time their respective services are installed, unless the schema was previously extended using another method, such as the YaST plug-in (see "Using the YaST Plug-in to Extend the Schema" on page 27).

- CIFS

- Directory Services*
- iFolder
- iPrint
- DHCP
- DNS
- Domain Services for Windows
- Linux User Management*
- NCP
- NCS**

  Novell Cluster Services requires extending the schema manually. Follow the instructions in "Extending the eDirectory Schema to Add Cluster Objects" in the *OES 2 SP2: Novell Cluster Services 1.8.7 for Linux Administration Guide*.
- NetStorage
- NMAS*
- Novell Storage Services
- Storage Management Services*

Extending the Schema While Installing OES 2

The simplest way to extend the schema for OES 2 servers is to have a tree admin install the first OES 2 server and the first instance of each OES 2 service that you plan to run on your network.

After this initial installation, you can assign subcontainer admins with the required rights to install additional servers and services. For more information on the required rights for the various OES services, see "Rights Required for Subcontainer Administrators" on page 19.

Using the YaST Plug-in to Extend the Schema

If you want a subcontainer admin to install the first OES 2 server or the first instance of an OES 2 service in an existing tree, and you don't want to grant that admin the Supervisor right to the [Root] of the tree, you can extend the schema using YaST from either

- An OES 2 SP2 server running in another tree
- An OES 2 SP2 server that was installed without any OES 2 services added (the YaST plug-in is a default OES 2 component)

  or
- A SLES 10 SP3 server with the yast2-novell-schematool.rpm installed. The RPM is available on the OES 2 SP2 installation media and can be launched at a terminal prompt following installation by entering `yast2 novell-schematool`.

To run the Novell Schema Tool, do the following:

1. On the server's desktop, click *Computer* and open the *YaST Control Center*.
2. Click *Open Enterprise Server* > *Novell Schema Tool*.
3. Depending on the installation method you used, you might be required to insert your OES 2 installation media.

4 On the Novell eDirectory Extension Utility page, enter the information for an eDirectory server with a Read/Write replica of the Root partition.

   Be sure to enter the correct information to authenticate as an admin user with the Supervisor right at the [Root] of the target tree. Otherwise, the schema extension will fail.

5 If you are preparing the tree so that a subcontainer admin can install the first OES 2 SP1 or later server, select the services marked with an asterisk (*) in "Which OES 2 SP2 Services Require a Schema Extension?" on page 26.

   Although this step is not required if the tree already has an OES 2 SP1 or later server installed, selecting the marked services won't cause any problems.

6 Select all of the other services you plan to run on any of the OES 2 servers in the tree.

7 Click *Next*.

   The schema is extended.

Extending the Schema for Novell Cluster Services (NCS)

If you want a subcontainer administrator to install the first instance of NCS in a tree, you can extend the schema by following the instructions in "Extending the eDirectory Schema to Add Cluster Objects" in the *OES 2 SP2: Novell Cluster Services 1.8.7 for Linux Administration Guide*.

2.7 Deciding What Patterns to Install

A default SLES 10 SP3 installation has the following base technology, Graphical Environment, and Primary Function patterns selected for installation by default. With the exception explained in the two Important notes below, you can accept or deselect these patterns and install additional patterns as desired.

Table 2-3 *Standard SLES 10 SP3Installation Patterns*

Pattern	Description
Server Base System	Consists of all packages that are common to all Novell SUSE Linux Enterprise products. Also provides a Linux Standard Base 3.0 compliant runtime environment. This pattern is selected for installation by default. **IMPORTANT:** You must either install this pattern or the Common Code Base pattern.
Common Code Base	The largest system. It includes all packages available with SUSE Linux, except those that would result in dependency conflicts. **IMPORTANT:** You must either install this pattern or the Server Base System pattern.

Pattern	Description
Novell AppArmor	Novell AppArmor™ is an open source Linux application security framework that provides mandatory access control for programs, protecting against the exploitation of software flaws and compromised systems. AppArmor includes everything you need to provide effective containment for programs (including those that run as `root`) to thwart attempted exploits and even zero-day attacks. AppArmor offers an advanced tool set that largely automates the development of per-program application security so that no new expertise is required. This pattern is selected for installation by default.
GNOME Desktop Environment	The GNOME* desktop environment is an intuitive and attractive desktop for users. The GNOME development platform is an extensive framework for building applications that integrate into the rest of the desktop. This pattern is selected for installation by default.
X Window System	In continuous use for over 20 years, the X Window System* provides the only standard platform-independent networked graphical window system bridging the heterogeneous platforms in today's enterprise: from network servers to desktops, thin clients, laptops, and handhelds, independent of operating system and hardware. This pattern is selected for installation by default.
Print Server	Sets up a print server to host print queues so that they can be accessed by other computers on the same network, including machines running Microsoft* Windows* operating systems. The print server may accept print jobs from client computers and direct them to locally attached printers or to network printers. lpd, cups, and smb print servers and queues are supported. This pattern is selected for installation by default.

The OES add-on installation includes the following OES Services patterns.

Table 2-4 *OES Services Pattern Descriptions*

Pattern	Description
Novell AFP	Novell AFP server allows Mac clients to access data stored on NSS volumes in the same way they access data on a Mac OSX server. This service selects and installs these services: ◆ Novell Backup / Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Storage Services (NSS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)

Pattern	Description
Novell Archive and Version Services	Novell Archive and Version Services systematically captures and stores versions of your network files in an archive database, on a schedule that you determine. Users can search for a previous version of a file and quickly restore it. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory™ ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM) ◆ Novell Storage Services™ (NSS)
Novell Backup/Storage Management Services (SMS)	The Novell backup infrastructure (called Storage Management Services™ or SMS) provides backup applications with the framework to develop a complete backup and restore solution. SMS helps back up file systems (such as NSS) or application data (such as data from GroupWise®) on NetWare® and SUSE Linux Enterprise Server (SLES) to removable tape media or other media for off-site storage. It provides a single consistent interface for all file systems and applications across NetWare and SLES. This service selects and installs these services: ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell CIFS	CIFS (Common Internet File System) is a network sharing protocol. Novell CIFS enables Windows, Linux, and UNIX client workstations to copy, delete, move, save, and open files on an OES 2 server. CIFS allows read and write access from multiple client systems simultaneously. This service selects and installs these services: ◆ Novell Backup / Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Storage Services (NSS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)

Pattern	Description
Novell Cluster Services (NCS)	Novell Cluster Services™ is a server clustering system that ensures high availability and manageability of critical network resources including data, applications, and services. It is a multinode clustering product for Linux that is enabled for Novell eDirectory and supports failover, failback, and migration (load balancing) of individually managed cluster resources. Novell Cluster Services lets you add Linux nodes to an existing NetWare 6.5 cluster without bringing down the cluster, or it lets you create an all-Linux cluster. With a mixed cluster, you can migrate services between OS kernels, and if services are alike on both platforms (such as NSS), you can set the services to fail over across platforms. Using Novell Cluster Services with iSCSI technologies included in OES, you can build inexpensive clustered SANs on commodity gigabit Ethernet hardware. You can leverage existing hardware into a high availability solution supporting Linux and NetWare clusters. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell DHCP	Novell DHCP (Dynamic Host Configuration Protocol) uses eDirectory to provide configuration parameters to client computers and integrate them into a network. The eDirectory integration lets you have centralized administration and management of DHCP servers across the enterprise and lets you set up DHCP subnet replication via Novell eDirectory. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell DNS	Novell DNS uses Novell eDirectory to deliver information associated with domain names, in particular the IP address. This eDirectory integration lets you have centralized administration and management of DNS servers across the enterprise and lets you set up a DNS zone via Novell eDirectory. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)

Pattern	Description
Novell Domain Services for Windows	Novell Domain Services for Windows provides seamless cross-authentication capabilities between Windows/Active Directory and Novell OES 2 servers. It is a suite of integrated technologies that removes the need for the Novell Client when logging on and accessing data from Windows workstations in eDirectory trees. This technology simplifies the management of users and workstations in mixed Novell-Microsoft environments. This service selects and installs these services: ◆ Novell Backup / Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell DNS ◆ Novell iManager ◆ Novell iPrint ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM) ◆ Novell Storage Services (NSS) ◆ Novell NCP Server
Novell eDirectory	Novell eDirectory services are the foundation for the world's largest identity management, high-end directory service that allows businesses to manage identities and security access for employees, customers, and partners. More than just an LDAP data store, eDirectory is the identity foundation for managing the relationships that link your users and their access rights with corporate resources, devices, and security policies. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell FTP	Novell FTP (File Transfer Protocol) is integrated with Novell eDirectory so that users can securely transfer files to and from OES volumes. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell iFolder	Novell iFolder 3.8 is a simple and secure storage solution that can increase user productivity by enabling users to back up, access, and manage their personal files from anywhere, at any time. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)

Pattern	Description
Novell iManager	Novell iManager is a Web-based administration console that provides secure, customized access to network administration utilities and content from virtually anywhere you have access to the Internet and a Web browser. iManager provides the following benefits: ◆ Single point of administration for Novell eDirectory objects, schema, partitions, and replicas ◆ Single point of administration for many other network resources ◆ Management of many Novell products by using iManager plug-ins ◆ Role-Based Services (RBS) for delegated administration This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell iPrint	Novell iPrint lets employees, partners, and customers access printers from a variety of locations across the network and the Internet. From a Web browser, users can easily install any printer on the network from any location. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell iManager ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell Linux User Management (LUM)	Linux User Management (LUM) enables eDirectory users to function as local POSIX* users on Linux servers. This functionality lets administrators use eDirectory to centrally manage remote users for access to one or more OES servers. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Remote Manager (NRM)

Pattern	Description
Novell NCP Server / Dynamic Storage Technology	Novell NCP™ Server for Linux enables support for login scripts, mapping drives to OES servers, and other services commonly associated with Novell Client access. This means that Windows users with the Novell Client installed can be seamlessly transitioned to file services on OES. NCP Server includes Novell Dynamic Storage Technology, which allows rarely accessed files on NCP volumes to be automatically moved, according to policies set by the administrator, from faster-access storage to lower-cost storage media where the files can be more easily managed and backed up. Services included with NCP (NetWare Core Protocol) are file access, file locking, security, tracking of resource allocation, event notification, synchronization with other servers, connection and communication, print services and queue management, and network management. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell NetStorage	Novell NetStorage provides the solution for simple, Internet-based access to file storage. NetStorage is a bridge between a company's protected Novell storage network and the Internet. It lets users access files securely from any Internet location, with nothing to download or install on the user's workstation. With Novell NetStorage, a user can securely access files from any Internet-enabled machine. Users can copy, move, rename, delete, read, write, recover, and set trustee assignments (based on their privilege level) on files between a local workstation and a Novell storage network. Access is available from any Internet-attached workstation, anywhere in the world. There is no need to e-mail or copy data from one machine to another. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell iManager ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)

Pattern	Description
Novell Pre-Migration Server	A Novell Pre-Migration Server is not actually a service. Rather, it is a special-purpose server—the target of a Server ID Transfer Migration. Selecting this option causes this server to be installed without an eDirectory replica, thus preparing it to assume the identity of another server that you plan to decommission. For more information, see the *OES 2 SP2: Migration Tool Administration Guide*. You should also select and install all the services that you plan to migrate from the other server. Services that are not installed on this server prior to the migration cannot be migrated. This service selects and installs these services: ◆ Novell Backup / Storage Management Services (SMS) ◆ Novell eDirectory (without a replica) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell QuickFinder	QuickFinder™ lets your users find the information they're looking for on any of your public and private Web sites, your partners' sites, and any number of additional Web sites across the Internet or internal file servers, all from a single search form on your Web page. You can easily modify the look and feel of any of the sample search results pages to match your corporate design. You can create full-text indexes of HTML, XML, PDF, Word, OpenOffice.org, and many other document formats in almost any language with the QuickFinder Unicode* indexing engine. You can configure and maintain your indexes remotely from anywhere on the network with the QuickFinder Web-based administration module. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell Remote Manager (NRM)	Novell Remote Manager lets you securely access and manage one or more servers from any location through a standard Web browser. You can use Novell Remote Manager to monitor your server's health, change the configuration of your server, or perform diagnostic and debugging tasks. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM)

Pattern	Description
Novell Samba	Novell Samba provides Windows (CIFS and HTTP-WebDAV) access to files stored on an OES server's file system using an eDirectory username and password. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell Storage Services (NSS)	The Novell Storage Services (NSS) file system provides many unique and powerful file system capabilities. It is especially suited for managing file services for thousands of users in an organization. It also includes Novell Distributed File Services for NSS volumes. Unique features include visibility, trustee access control model, multiple simultaneous namespace support, native Unicode, user and directory quotas, rich file attributes, multiple data stream support, event file lists, and a file salvage subsystem. NSS volumes are cross-compatible between kernels. You can mount a non-encrypted NSS data volume on either the Linux or NetWare kernel and move it between them. In a clustered SAN, volumes can fail over between kernels, allowing for full data and file system feature preservation when migrating data to Linux. **IMPORTANT:** If you select this service, you might need to reconsider the disk partition setup you have chosen. For information, see Appendix A, "Installing with EVMS as the Volume Manager of the System Device," on page 213. This service selects and installs these services: ◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell NCP Server ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)

If you want to install these services, you can select them to install with most other patterns during the initial server installation by customizing the installation or you can install them after installing your initial Open Enterprise Server. For more information, see "Customizing the Software Selections" on page 52 and "Installing/Configuring OES 2 SP2 on an Existing Server" on page 107.

2.8 Install Only One Server at a Time

You should install one server at a time into a tree, then wait for the installation program to complete before installing an additional server into the same tree.

2.9 What's Next

Proceed to one of the following sections based on the task that you want to perform:

- “Installing OES 2 SP2” on page 39
- “Upgrading to OES 2 SP2” on page 113
- “Updating (Patching) an OES 2 SP2 Server” on page 149
- “Using AutoYaST to Install and Configure Multiple OES Servers” on page 169
- “Installing, Upgrading, or Updating OES on a Xen-based VM” on page 179
- “Installing and Managing NetWare on a Xen-based VM” on page 193
- “Installing with EVMS as the Volume Manager of the System Device” on page 213

3 Installing OES 2 SP2

Novell® Open Enterprise Server (OES) 2 SP2 Linux is an add-on product to SUSE® Linux Enterprise Server (SLES) 10 SP3. When you install and configure OES, you can also install and configure SLES 10 SP3. Therefore, it is helpful to understand how to perform a SLES 10 SP3 installation.

For detailed information on performing a SLES installation, see the *SLES 10 SP3 Installation and Administration Guide (http://www.novell.com/documentation/sles10/book_sle_reference/data/book_sle_reference.html)*.

This section includes brief steps for performing a full installation of OES and provides information on the following topics:

3.1 Obtaining OES 2 Software

For information on obtaining OES software, see "Getting and Preparing OES 2 Software" in the *OES 2 SP2: Planning and Implementation Guide*.

3.2 Setting Up an Installation Source

This section covers how to get the media you need for an installation and how to set up installation sources for installing OES:

3.2.1 Preparing a Network Installation Source

This section contains the following information:

Requirements

To set up a network installation source, you need the following:

- ❑ A server to act as the YaST Network Installation server:

  This server can be SLES 9, SLES 10, SUSE Linux 9.3 or later, OES 1 or OES 2, Windows, or NetWare 6.5.
- ❑ A computer to become the new OES server

Both servers need to be connected to the network and able to communicate with each other.

If you have DHCP on your network, using DHCP works well to begin the initial network installation. During the installation, you are prompted to configure your OES server with a static IP address. The static IP address is required for the configuring OES network services on your server.

If you don't have DHCP on your network, you need to do a manual installation and configure your OES server with a static IP address, subnet mask, a default gateway, and a name server. You do not need to redo this network configuration later in the installation because it is already set up. The instructions for this come later in the installation procedure. (See "Installing OES 2 SP2 As a New Installation" on page 43.)

Procedure

To prepare a network installation source on a NetWare server, see Appendix C, "Setting Up an Installation Source on NetWare," on page 225.

To prepare a network installation source on a Linux or Window server, see "Setting Up the Server Holding the Installation Sources" (http://www.novell.com/documentation/sles10/sles_admin/data/sec_deployment_remoteinst_instserver.html) in the *SLES 10 SP3 Installation and Administration Guide* (http://www.novell.com/documentation/sles10/sles_admin/data/book_sle_reference.html) and the following instructions.

1. Download or copy the ISO image files to a directory of your choice. See "Getting and Preparing OES 2 Software" in the *OES 2 SP2: Planning and Implementation Guide*.
2. Configure your Linux server to be a YaST installation server and select the location for the root of the network installation.

   The three protocol options to choose from for configuring the YaST installation server are NFS, FTP, and HTTP. For the protocol configuration procedures, see the following:

   - "NFS Protocol Configuration" on page 40
   - "FTP Protocol Configuration" on page 41
   - "HTTP Protocol Configuration" on page 41

   FTP and HTTP do not allow you to serve the files without possible modifications to `.conf` files. NFS is the simplest protocol to configure and is recommended.
3. Create a boot CD using the `.iso` image file for *SUSE Linux Enterprise Server SP3 CD 1* and label it with that name.

   For information on creating this CD, see "Preparing Physical Media for a New Server Installation or an Upgrade" on page 42.

   This CD will be the network installation boot CD.

With these steps completed, you are ready to perform a new installation or upgrade using a network installation source. See "Installing OES 2 SP2 As a New Installation" on page 43 or "Upgrading to OES 2 SP2" on page 113.

NFS Protocol Configuration

An NFS share can be shared easily from almost any location on your file system. Use the following procedure if you choose to use this protocol:

1. At your network installation server, launch YaST.

2 Select *Network Services*, then click *NFS Server*.

   You might be prompted to install the NFS server.

3 On the NFS Server configuration screen, select *Start* in the NFS Server section, select *Open Port in Firewall* in the Firewall section, then click *Next*.

4 In the Directories section, click *Add Directory* and specify or browse to the directory where you have created the install root (source directory), then click *OK*.

5 Accept the defaults in the pop-up window for adding a Host.

   If you are experienced with NFS configurations, you can customize the configuration.

6 Click *Finish*.

FTP Protocol Configuration

These instructions use pure ftpd and can be installed using YaST. Depending on the FTP server you use, the configuration might be different.

If you have created your install root (source directory) within your FTP root, you can forego the following procedure and simply start pure ftpd.

The default configuration of pure ftpd runs in chroot jail, so symlinks cannot be followed. In order to allow FTP access to the install root created outside of the FTP root, you must mount the install root directory inside of the FTP root.

If you have not created your install root within your FTP root and you choose to use this protocol:

1 Create a directory inside of your FTP root.

2 Run the following command:

   ```
   mount --bind /path_to_install_root /path_to_directory_in_ftp_root
   ```

   For example,

   ```
   mount --bind /tmp/OES /srv/ftp/OES
   ```

3 (Optional) If you want to make this install root permanent, add this command to the `/etc/fstab` file.

4 Start pure ftpd.

HTTP Protocol Configuration

These instructions use Apache2 as provided by SLES 10.

If you choose to use this protocol:

1 Modify the `default-server.conf` file of your HTTP server to allow it to follow symlinks and create directory indexes.

   The `default-server.conf` file is located in the `/etc/apache2` directory. In the `Directory` tag of the `default-server.conf` file, remove `None` if it is there, add `FollowSymLinks` and `Indexes` to the `Options` directive, then save the changes.

2 (Conditional) If the install root is outside of the HTTP root, create a symbolic link to the install root with the following command:

   ```
   ln -s /path_to_install_root /path_to_link
   ```

   For example,

```
ln -s /tmp/OES /srv/www/htdocs/OES
```

3 Restart Apache.

3.2.2 Preparing Physical Media for a New Server Installation or an Upgrade

To prepare physical media for an installation or upgrade, you must first download ISO image files and then burn the CDs or DVDs that you need for your server. Detailed download instructions are available in "Getting and Preparing OES 2 Software" in the *OES 2 SP2: Planning and Implementation Guide*.

Table 3-1 lists the image files you need, depending on whether your server has a CD drive or a CD/DVD combo drive.

Table 3-1 *Files to Download*

Platform	Files needed
32-bit server with CD drive	• SLES-10-SP3-CD-i386-GM-CD1.iso • SLES-10-SP3-CD-i386-GM-CD2.iso • SLES-10-SP3-CD-i386-GM-CD3.iso • SLES-10-SP3-CD-i386-GM-CD4.iso • OES2-SP2-i386-CD1.iso
32-bit server with CD/DVD drive	• SLES-10-SP3-DVD-i386-GM-DVD1.iso • OES2-SP2-i386-CD1.iso
64-bit server with CD drive	• SLES-10-SP3-CD-x86_64-GM-CD1.iso • SLES-10-SP3-CD-x86_64-GM-CD2.iso • SLES-10-SP3-CD-x86_64-GM-CD3.iso • SLES-10-SP3-CD-x86_64-GM-CD4.iso • OES2-SP2-x86_64-CD1.iso
64-bit server with CD/DVD drive	• SLES-10-SP3-DVD-x86_64-GM-DVD1.iso • OES2-SP2-x86_64-CD1.iso
32-bit server with CD drive	• SLES-10-SP3-CD-i386-GM-CD1.iso • SLES-10-SP3-CD-i386-GM-CD2.iso • SLES-10-SP3-CD-i386-GM-CD3.iso • SLES-10-SP3-CD-i386-GM-CD4.iso • OES2-SP2-i386-CD1.iso

IMPORTANT: You can download the OES 2 CD and the SLES 10 DVD ISO files listed in Table 3-1 from the <OES 2 SP2 download page (Insert_URL)>.

The SLES 10 SP3 CD ISO files listed in Table 3-1 are only available on the <SLES 10 SP3 download page (Insert_URL)>.

1. Download the ISO files you need for your hardware capabilities.
2. Insert a blank, writable CD or DVD into your CD or DVD burner.
3. Select the option to create a CD or DVD from an image file.
4. Select *ISO* as the file type.
5. Select the first image file (see Table 3-1) from the location you downloaded it to.
6. Complete the CD or DVD creation process.
7. Label the disk.
8. Repeat this process for each of the ISO image files you downloaded.

3.3 Installing OES 2 SP2 As a New Installation

This section does not provide step-by-step installation instructions because the installation interface is mostly self-explanatory. It does, however, provide information about important steps in the process that you might need help with.

3.3.1 Starting the OES 2 SP2 Installation

Insert the first disc of the *SUSE Linux Enterprise Server 10 SP3* installation media that you created into the CD-ROM or DVD drive of the computer that you want to be your OES server, then boot the machine. Then continue with one of the following procedures:

Installation Using a Network Installation Source with DHCP

1. From the CD boot menu, select one of the following Installation options that matches your environment, but do not press Enter.
   - **Installation:** The normal installation mode. All modern hardware functions are enabled.
   - **Installation—ACPI Disabled:** If the normal installation fails, this might be because of the system hardware not supporting ACPI (advanced configuration and power interface). If this seems to be the case, use this option to install without ACPI support.

- **Installation—Local APIC Disabled:** If the normal installation fails, this might be because of the system hardware not supporting local APIC (advanced programmable interrupt controllers). If this seems to be the case, use this option to install without local APIC support.

  If you are not sure, try I*nstallation—ACPI Disabled* or *Installation—Safe Settings* first.

- **Installation—Safe Settings:** Boots the system with the DMA mode (for CD-ROM drives) and power management functions disabled. Experts can also use the command line to enter or change kernel parameters.

2 At this point you can pre-specify the IP address information, etc. on the *Boot Options* line (see "Using Custom Boot Options" in the *SUSE Linux Enterprise Server Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/sec_deployment_remoteinst_bootinst.html#sec_deployment_remoteinst_bootinst_custom)), or you can continue with Step 3 and input everything as the install prompts you.

  If you want to specify boot options parameters, do it now. Then press Enter and continue with Step 6 on page 44.

3 Press F4, and then select the network installation type (CD or DVD, SLP, FTP, HTTP, NFS, SMB/CIFS) that you set up on your network installation server.

  See Step 2 on page 40 of the Preparing a Network Installation Source procedure.

4 Specify the required information (server name and installation path), then select *OK*.

5 Press Enter to begin the installation.

6 Follow the screen prompts, referring to the information in the following sections as needed (remember that not all required selections are documented):

  6a "Specifying the Installation Mode" on page 46.

  6b "Specifying the Add-On Product Installation Information" on page 47.

  6c "Setting Up the Clock and Time Zone" on page 48.

  6d "Specifying the Installation Settings for the SLES Base and OES Installation" on page 48.

  6e "Specifying Configuration Information" on page 54.

  6f "Finishing the Installation" on page 71.

7 Complete the server setup by following the procedures in "Completing OES Installation or Upgrade Tasks" on page 145.

Installation Using a Network Installation Source without DHCP

1 From the CD boot menu, select one of the following Installation options that matches your environment, then press Enter.

- **Installation:** The normal installation mode. All modern hardware functions are enabled.
- **Installation—ACPI Disabled:** If the normal installation fails, this might be because of the system hardware not supporting ACPI (advanced configuration and power interface). If this seems to be the case, use this option to install without ACPI support.
- **Installation—Local APIC Disabled:** If the normal installation fails, this might be because of the system hardware not supporting local APIC (advanced programmable interrupt controllers). If this seems to be the case, use this option to install without local APIC support.

  If you are not sure, try I*nstallation—ACPI Disabled* or *Installation—Safe Settings* first.

- **Installation—Safe Settings:** Boots the system with the DMA mode (for CD-ROM drives) and power management functions disabled. Experts can also use the command line to enter or change kernel parameters.

2 At this point you can pre-specify the IP address information, etc. on the *Boot Options* line (see "Using Custom Boot Options" in the *SUSE Linux Enterprise Server Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/sec_deployment_remoteinst_bootinst.html#sec_deployment_remoteinst_bootinst_custom)), or you can press Enter, continue with Step 3, and input everything as the install prompts you.

   If you want to specify boot options parameters, do it now. Then press Enter and continue with Step 19 on page 45.

3 When you receive the following error, select *OK* and press Enter:

```
Could not find the SUSE Linux Enterprise Server 10 Installation source.
Activating manual set up program.
```

4 Select the language, then select *OK* and press Enter.

5 Select a keyboard map, then select *OK* and press Enter.

6 Select *Start Installation or System*, then select *OK* and press Enter.

7 Select *Start Installation or Update*, then select *OK* and press Enter.

8 Select *Network*, press Enter, then select *OK* and press Enter.

9 Select the network protocol that matches the configured protocol on your network installation server, then press Enter.

10 (Conditional) If you have more than one network interface card, select one of the cards, then press Enter.

   We recommend eth0.

11 When prompted whether you want to use DHCP, select *No*, then press Enter.

12 Specify the IP address for the server, then press Enter.

13 Specify the subnet mask, then press Enter.

14 Specify the gateway, then press Enter.

15 Specify the IP address of a name server, then press Enter.

16 Specify the IP address of the network installation server, then press Enter.

17 (Conditional) Depending on the protocol you specified, you might see additional screens for FTP or HTTP. Select the options that are appropriate for your network, then continue with Step 18.

18 Specify the path to your installation source on the network installation server, then press Enter.

19 Follow the prompts, using the information contained in the following sections:

   19a "Specifying the Installation Mode" on page 46.

   19b "Specifying the Add-On Product Installation Information" on page 47.

   19c "Setting Up the Clock and Time Zone" on page 48.

   19d "Specifying the Installation Settings for the SLES Base and OES Installation" on page 48.

19e “Specifying Configuration Information” on page 54.

19f “Finishing the Installation” on page 71.

20 Complete the server setup by following the procedures in “Completing OES Installation or Upgrade Tasks” on page 145.

New Server Installation Using Physical Media or ISO

1. From the CD boot menu, select the second option (*Installation*), then press Enter.
2. Select the language that you want to use, then click *Next*.
3. Read and accept the license agreement, then click *Next*.
4. (Conditional) If you haven’t already verified that the media you burned is valid, you can check it using the *Media Check* option; otherwise, click *Next* to continue with the installation.

   The installation process prompts you for each CD at the appropriate time. The progress status at the bottom of the screen indicates which CD will be requested next.
5. Follow the prompts, using the information contained in the following sections:

   5a “Specifying the Installation Mode” on page 46.

   5b “Specifying the Add-On Product Installation Information” on page 47.

   5c “Setting Up the Clock and Time Zone” on page 48.

   5d “Specifying the Installation Settings for the SLES Base and OES Installation” on page 48.

   5e “Specifying Configuration Information” on page 54.

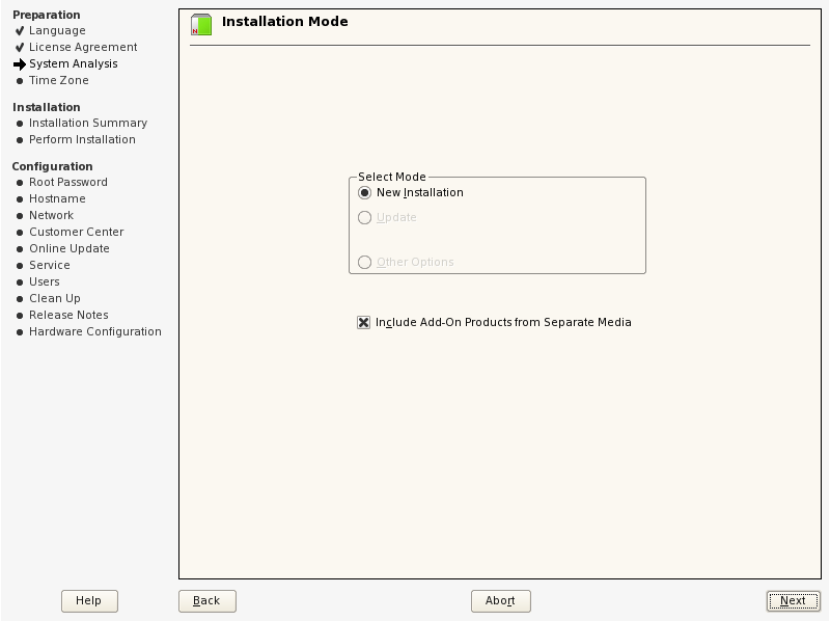
   5f “Finishing the Installation” on page 71.
6. Complete the server setup by following the procedures in “Completing OES Installation or Upgrade Tasks” on page 145.

3.3.2 Specifying the Installation Mode

When selecting the type of installation, select *New Installation*.

1. When the *Installation Mode* screen displays, select the following two menu options, then click *Next*:
   1. *New Installation*

2. *Include Add-On Products from Separate Media*



2 Continue with Section 3.3.3, “Specifying the Add-On Product Installation Information,” on page 47.

3.3.3 Specifying the Add-On Product Installation Information

When the *Add-On Product Installation* page displays:

1 Click *Add*.

2 If you are installing OES 2 from a CD, do the following:

2a In the Add-On Product Media dialog, click *CD*, then click *Next*.

2b In the Insert the Add-On Product CD dialog, select the appropriate drive where you want to insert the OES CD.

2c Click *Eject*.

2d Insert the CD labeled *Novell Open Enterprise Server 2 SP2 CD 1*, then click *Continue*.

3 If you are using an alternate installation source, such as a network installation source, click the appropriate option for your situation, then click Next and supply the required information.

4 Read and accept the Novell Open Enterprise Server 2 license agreement, then click *Next*.

5 Confirm that the Add-On Product Installation page shows the correct path to the OES media, then click *Next*.

6 Continue with Section 3.3.4, “Setting Up the Clock and Time Zone,” on page 48.

3.3.4 Setting Up the Clock and Time Zone

1 Make sure the *Clock*, *Region*, *Timezone*, and *Time and Date* settings are what you want, then click *Next*.

You can configure this information after the installation is complete, but it is easier to do it during the installation.

2 Continue with Section 3.3.5, "Specifying the Installation Settings for the SLES Base and OES Installation," on page 48.

3.3.5 Specifying the Installation Settings for the SLES Base and OES Installation

The Installation Settings page lets you specify which software and services are installed on your server.

- **Overview tab:** This lets you specify everything that is normally required for an OES installation.
- **Expert tab:** This lets you fully customize your SLES installation settings. For detailed information, see "Deployment" (http://www.novell.com/documentation/sles10/book_sle_reference/data/part_setup.html) in the *SLES 10 SP3 Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/book_sle_reference.html). Keep in mind, however, that the SLES guide does not contain instructions for OES-specific components or configurations.

IMPORTANT: If you accept the defaults at this point in the installation process, only the base OES components are installed.

You can add OES services later, but you should at least read the guidelines and follow the applicable procedures in the following sections:

- "Setting Up Disk Partitions" on page 48
- "Customizing the Software Selections" on page 52
- "Accepting the Installation Settings" on page 53

Setting Up Disk Partitions

In most cases, YaST proposes a reasonable partitioning scheme that can be accepted without change. You can also use YaST to customize the partitioning.

- "Guidelines" on page 49
- "NSS on the System Disk" on page 50
- "Security Flag Recommendations" on page 50
- "Partitioning X86 Machines" on page 51
- "Disk Partition Statistics" on page 51
- "Combining Hard Disk Partitions" on page 51

Guidelines

Table 3-2 presents guidelines for setting up disk partitions on your OES server. For more information, see "Installation Settings" (http://www.novell.com/documentation/sles10/book_sle_reference/data/sec_i_yast2_proposal.html) in the *SLES 10 SP3 Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/book_sle_reference.html)

Table 3-2 *Partition Guidelines*

Partition to Create	Other Considerations
`/boot`	Depending on the hardware, it might be useful to create a boot partition (`/boot`) to hold the boot mechanism and the Linux kernel. You should create this partition at the start of the disk and make it at least 8 MB or 1 cylinder. As a rule of thumb, always create such a partition if it was included in the YaST original proposal. If you are unsure about this, create a boot partition to be on the safe side. **IMPORTANT:** In a Xen VM installation, format the `/boot` partition using *Ext2* as the file system. For a technical explanation of why this is necessary, see "Paravirtual Mode and Journaling File Systems (http://www.novell.com/documentation/sles10/xen_admin/data/sec_xen_filesystem.html)" in the *Virtualization with Xen (http://www.novell.com/documentation/sles10/xen_admin/data/bookinfo.html)* guide.
`swap`	This should normally be twice the size of the RAM installed on your server, up to 1 GB. If you create a `/boot` partition, create the `swap` partition second. Otherwise, create the `swap` partition first.
`/`	Define this partition as 3 GB or more. In all cases, create this partition after you create the `swap` partition. Keep in mind that this root (`/`) partition contains all of the partitions listed below that you don't specifically create.
`/var`	This contains system logs and should therefore be a separate partition to avoid impacting system and service stability due to a disk-full condition. Define this partition as 4 GB or more.
`/opt`	Some (mostly commercial) programs install their data in /opt. Define this partition as 4 GB or more.
`/usr`	Creating this as a separate partition makes updating the server easier if you need to reinstall the system from scratch. Define this partition as 4 GB or more.
`/srv`	This contains the Web and FTP servers. Consider making this a separate partition to avoid having someone "flood" the disk by accident or on purpose, which impacts system and service stability.
`/home`	User Home directories go here. Consider making this a separate partition to avoid having someone "flood" the disk by accident or on purpose, which impacts system and service stability. You can allocate the rest of the disk space to this partition.

Partition to Create	Other Considerations
/tmp	Creating this as a separate partition is optional. However, because it is writable by everyone, best practices suggest creating a separate partition to avoid having someone flood the disk by accident or on purpose, which impacts system and service stability.
	Place application specific files on a separate partition.
	If you are building a mail server, note where the mail spools reside because they can grow quite large, and you'll need to anticipate this when you are defining partition sizes.

NSS on the System Disk

For OES, Novell Storage Services™ (NSS) volumes can be used only as data volumes, not as system volumes.

Additionally, they cannot be created as part of the install process.

However, you must consider whether you will be creating them in the future *on the storage device where you are installing Linux*. (Creating NSS volumes on storage devices that don't contain Linux system partitions requires no special handling.)

The default volume manager for Linux POSIX volumes on SUSE Linux is LVM (Linux Volume Manager). However, NSS volumes cannot be created on devices managed by LVM; they require EVMS (Enterprise Volume Management System) instead.

IMPORTANT: If you have only a single storage device on the server (such as a single physical disk or a hardware RAID 1 or RAID 5 device) and you plan to use NSS volumes for storing data, you must follow the instructions in "Installing with EVMS as the Volume Manager of the System Device" on page 213 to partition that storage device before proceeding.

You must also follow the EVMS setup instructions if you are creating Linux system partitions on other storage devices that you also want to contain NSS volumes.

Security Flag Recommendations

The following table indicates the recommended security flags for each partition. A question mark indicates that some software might not work if this flag is set.

Mount Point	Mount Options
/	
/var	nosuid
/tmp	nosuid
/home	nosuid, nodev, noexec?
/srv	nosuid?, nodev?, noexec?, ro? (after installation)
/usr/local	nosuid?, nodev?, ro? (after installation)

Please note that the installation process for proprietary software might fail if files in /tmp cannot be suid and devices may not work in /usr/local, etc. In such cases, remount those partitions temporarily with security deactivated.

Partitioning X86 Machines

- There can be a maximum of four primary partitions or three primary partitions and one extended partition (an extended partition can hold 15 (SCSI) or 63 (IDE) logical partitions).
- Each partition is assigned a partition type, depending on the file system planned for the partition.
- Each partition holds its own file system.
- Partitions are mounted into the file system tree at mountpoints. The content of the partition is visible to users with sufficient access privileges below the mountpoint.
- One of the partitions has to hold the root (`/`) file system (other partitions can be integrated into the root file system using the mount command).
- The /etc/fstab file holds partition and mount point information to allow automatic mounting at boot time.
- Device files in the "device" (`/dev`) partition are used to represent and address partitions; for example:

`/dev/hda`	Master disk on the first IDE channel
`/dev/hda1`	First primary partition on that disk
`/dev/hda5`	First logical partition with an extended partition on that disk
`/dev/sdb`	Second SCSI disk
`/dev/sdb3`	Third primary partition on that disk

Disk Partition Statistics

Use the following to get information about system storage usage:

`df`	disk free prints information about partitions
`df -h`	Provides information in Megabyte or Gigabyte as applicable (human readable format)
`du`	Displays disk usage
`du /dirA`	Displays size of each file and directory in dirA
`du -sh`	Prints a summary of information in Megabyte or Gigabyte

Combining Hard Disk Partitions

- Partitions from two or more hard disks can be combined using the logical volume manager (LVM).
- Partitions (physical volumes) can be combined into a volume group, which in turn, can be divided into logical volumes that contain their own file systems.

Doing this increases flexibility as physical volumes can be easily added to the volume group if more storage space is needed. Logical volumes can be increased while the machine is up and running.

Customizing the Software Selections

IMPORTANT: To install any of the OES patterns, you must customize the software selections. If you don't make any selections, only the base SLES 10 and base OES packages are installed. However, you can install any of the patterns after the base SLES installation is complete. See "Installing/Configuring OES 2 SP2 on an Existing Server" on page 107.

To customize which software packages are installed on the server:

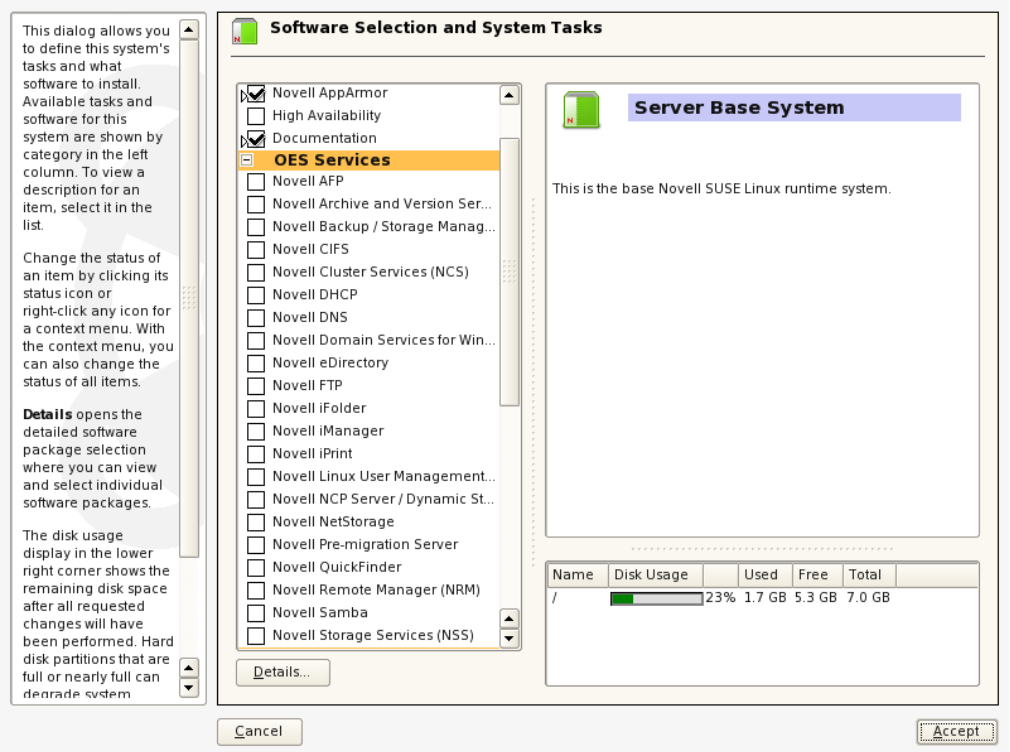
1 On the Installation Settings page, click *Software*.

The Open Enterprise Server add-on adds the OES Services category of patterns to the base software selection categories offered by the SLES 10 installation. OES Services include patterns that contain Novell services or products such as Novell DNS and DHCP services, iPrint, or iManager.

None of the OES Services is selected by default. This lets you fully customize your OES server.

2 At this point, you can do the following to customize your software selections:

- Select any number of the OES Services patterns.



A description of each pattern displays to the right of the pattern when it is selected. For a description of OES Services patterns and the components selected with each pattern, see Table 2-4 on page 29.

You can manually change the default SLES selections by changing the install status and selecting the patterns offered in each category.

IMPORTANT: If you deselect a pattern after selecting it, you are instructing the installation program to not install that pattern and all of it dependent patterns. Rather than deselecting a pattern, click *Cancel* to cancel your software selections, then click the *Software* heading again to choose your selections again.

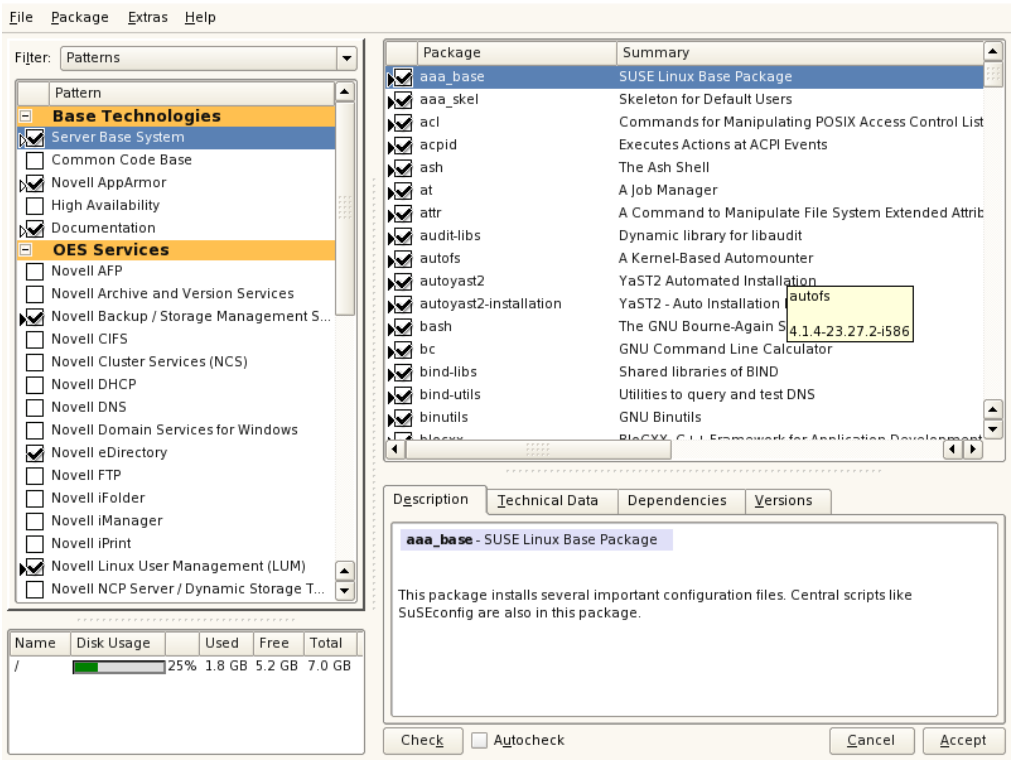
Selecting only the patterns that you want to install ensures that the patterns and their dependent patterns and packages are installed.

If you click *Accept*, then return to software pattern selection page, the selections that you made become your base selections and must be deselected if you want to remove them from the installation proposal.

You must install at least one of the SLES Base Technologies patterns.

Selecting a pattern automatically selects the other patterns that it depends on to complete the installation.

- You can view the details of your selection and add or remove specific packages for the installation by clicking *Details*.



3 When you have the software components selected that you want to install, click *Accept*.

4 If prompted with the license agreement for *Professional TrueType Fonts*, click *Accept*.

5 (Conditional) If the prompt for *Automatic Changes* displays, click *Continue*.

6 (Conditional) If prompted, resolve any dependency conflicts.

Accepting the Installation Settings

1 Review the final Installation Summary page to ensure that you have all the Installation settings you desire.

2 After you have changed all the Installation Settings as desired, click *Accept*.

3 On the Confirm Installation page, click *Install*.

The base installation settings are applied and the packages are installed.

4 For installations using a network installation source, you can remove the network boot CD (*SLES 10 SP3 CD 1*) from the CD drive.

5 For installations using a CD or DVD installation source, leave the CD or DVD in the CD-ROM or DVD drive.

6 After the server reboot, proceed with "Specifying Configuration Information" on page 54.

3.3.6 Specifying Configuration Information

When the server reboots, you are required to complete the following configuration information:

1. "Specifying the Password for the System Administrator "root"" on page 54
2. "Specifying Network Configuration Settings" on page 55
3. "Testing the Connection to the Internet" on page 57
4. "Specifying Novell Customer Center Configuration Settings" on page 57
5. "Updating the Server Software During the Installation" on page 60
6. "Specifying Service Configuration Settings" on page 63
7. "Specifying LDAP Configuration Settings" on page 64
8. "Specifying eDirectory Configuration Settings" on page 66
9. "Configuring Novell Open Enterprise Server Services" on page 70

Specifying the Password for the System Administrator "root"

In the Password for the System Administrator root page,

1 Specify the password for the `root` administrator.

For security reasons, the `root` user's password should be between five and eight characters long and should contain a mixture of both uppercase and lowercase letters and numbers. The maximum length for passwords is 72 characters, and passwords are case sensitive. If you have a password longer than eight characters, click *Expert Options* > *Blowfish* > *OK*.

2 Confirm the password.

3 Click *Next*.

Specifying the Hostname and Domain Name

On the Hostname and Domain Name page,

1 Specify the DNS hostname associated with the IP address you have or will assign to the server.

2 Specify the DNS domain name for the server.

3 Deselect *Change Hostname via DHCP*.

4 Click *Next*.

Specifying Network Configuration Settings

On the Network Configuration page, you can change the configuration for the components listed below. In this section, we only give details for the Network Interfaces and Firewall settings.

- “Network Interface” on page 55
- “Firewall” on page 56

Configuration success is directly tied to specific networking configuration requirements. Make sure that the following settings are configured exactly as specified for the Network Interfaces dialogs.

1. Network Mode
2. Firewall
3. IPV6
4. Network Interfaces
5. DSL Connections
6. ISDN Adapters
7. Modems
8. VNC Remote Administration
9. Proxy

Network Interface

Specify the setting for each network board on the server:

1 On the *Network Configuration* page, click *Network Interfaces.*

2 In the *Network Card Configuration Overview* dialog, select the network card you want to configure, then click *Edit*.

3 Select *Static Address Setup*, then specify the IP address and the subnet mask for the interface.

By default, the OES installation requires you to configure the network card to use a static IP address.

4 In the *Detailed Settings* list, select *Hostname and Name Server*.

4a In the *Name Servers and Domain Search List* panel, specify from one to three DNS server IP addresses.

4b Click *OK* to return to the *Detailed Settings* list.

5 In the *Detailed Settings* list, select *Routing*.

5a Specify the IP address of the default gateway on the subnet where you are installing the OES server.

5b Click *OK* to return to the *Detailed Settings* list.

6 Click *Next* to return to the *Network Card Configuration Overview* dialog.

7 Complete Step 2 through Step 6 for each network board, then click *Next* to return to the main *Network Configuration* page.

Firewall

For security reasons, a firewall is started automatically on each configured interface. The configuration proposal for the firewall is updated automatically every time the configuration of the interfaces or services is modified.

Many of the OES services require an open port in the firewall. Table 3-3 shows the ports that are automatically opened when each listed OES service is configured.

Table 3-3 *Open Enterprise Server Services and Ports*

Service	Default Ports
Domain Services for Windows	◆ 1636
eDirectory™	◆ 389 (ldap) ◆ 636 (secure ldap) ◆ 8028 (http for iMonitor) ◆ 8030 (secure http for iMonitor) ◆ 524 (ncp)
iManager	◆ 80 http ◆ 443 secure http
iPrint	◆ 80 http ◆ 443 secure http ◆ 631 ipp
Novell AFP	◆ 548
Novell Archive and Version Services	◆ 26029
Novell CIFS	◆ 636 (secure ldap)
Novell DHCP	◆ 67
Novell DNS	◆ 53 http ◆ 953 secure http
Novell FTP	◆ 21
Novell Information Portal	◆ 80 http ◆ 443 secure http
Novell NetWare Core Protocol (NCP™)	◆ 524
Novell Remote Manager	◆ 8008 http ◆ 8009 secure http
OpenWBEM	◆ 5988 http ◆ 5989 secure http
QuickFinder™	◆ 80 http ◆ 443 secure http

Service	Default Ports
Samba	◆ 139 (netbios) ◆ 445 microsoft-ds
Secure Shell	◆ 22
Storage Management Services (Backup)	◆ 40193 smdr daemon
UDP	◆ 524

To adapt the automatic settings to your own preferences,

1. Click *Change* > *Firewall*.
2. In the left panel select the settings you want to change, then make the changes in the right panel.
3. When you are finished, click *Accept*.

For more information about the firewall, see Section 44.4.1, "Configuring the Firewall with YaST" in the *SUSE Linux Enterprise Server Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/sec_fire_suse.html#sec_fire_suse_yast).

To disable the firewall:

1. On the *Network Configuration* page, under the *Firewall* heading, click *enabled* on the *Firewall is enabled* status line.

   When the firewall is disabled, the status for Firewall should read *Firewall is disabled*.
2. When all settings in the Network Configuration page are set as desired, click *Next* to save the configuration, then continue with "Testing the Connection to the Internet" on page 57.

Testing the Connection to the Internet

On the *Test Internet Connection* page:

1. Select *Yes*, *Test Connection to the Internet*, then click *Next*.

   Obtaining the latest SUSE release notes might fail at this point. If it does, view the log to verify that the network configuration is correct, then, click *Next*.

   If the network configuration is not correct, click *Back* > *Back* and fix your network configuration. See "Network Interface" on page 55.

   Skipping this test also skips downloading release notes, configuring the Novell Customer Center, and updating online.
2. Continue with "Specifying Novell Customer Center Configuration Settings" on page 57. If you skip this test, continue with "Specifying Service Configuration Settings" on page 63.

Specifying Novell Customer Center Configuration Settings

To receive support and updates for your OES 2 SP2 server, you must register it in the Novell Customer Center (NCC). When the Novell Customer Center Configuration page is displayed, you have two options. You can choose to register the server during the installation or register it later.

To register the server and get online update after the installation is complete:

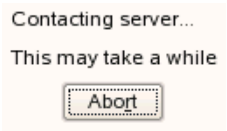
1. Click *Configure Later*.
2. Continue with "Specifying Service Configuration Settings" on page 63.
3. Register the server after the installation is complete by using the procedures in Section 7.3, "Registering the Server in the Novell Customer Center," on page 151.

To register the server during the installation:

1. On the Novell Customer Center Configuration configuration page, select all of the following options, then click *Next*.

Option	What it Does
Configure Now	Proceeds with registering this server and the SLES 10 SP3 and OES 2 SP2 product in the Novell Customer center.
Hardware Profile	Sends the information to the Novell Customer Center about the hardware that you are installing SLES 10 SP3 and OES 2 SP2 on.
Optional Information	Sends optional information to the Novell Customer Center for your registration. For this release, this option doesn't send any additional information.
Registration Code	Makes the registration with activation codes mandatory.
Regularly Synchronize with the Customer Center	Keeps the installation sources for this server valid. It does not remove any installation sources that were manually added.

2. After you click *Next*, the following message is displayed.



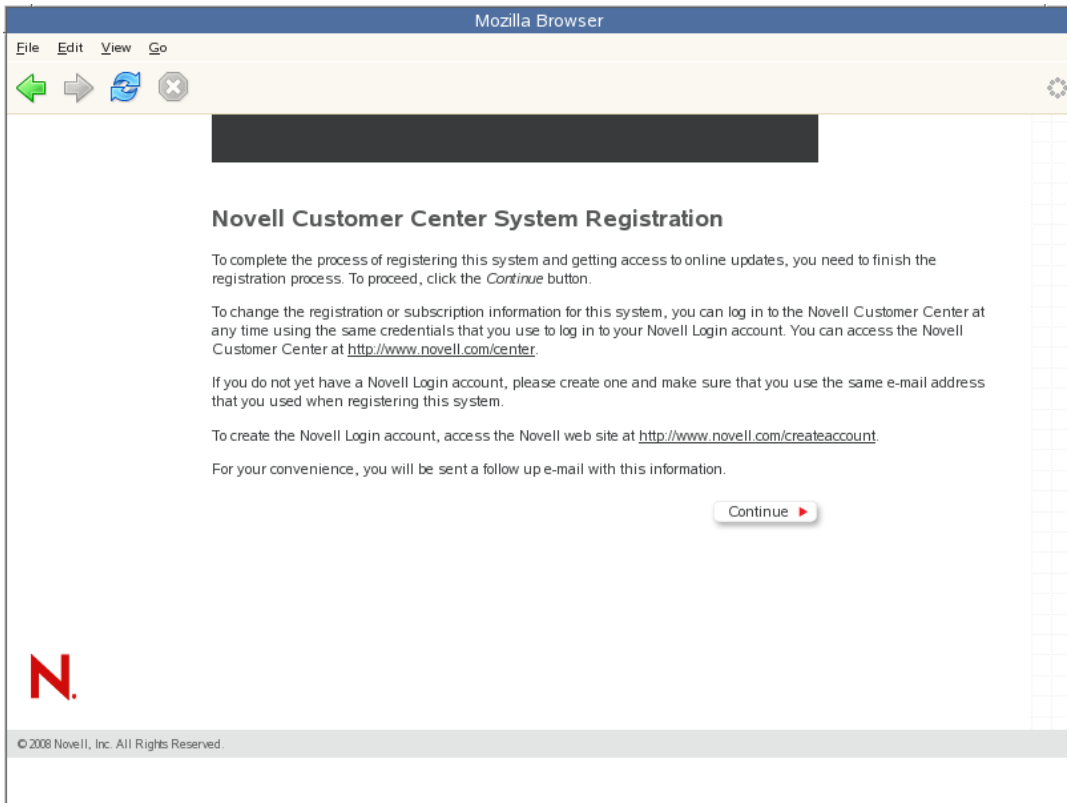
   Wait until this message disappears and the Manual Interaction Required page displays.

3. On the Manual Interaction Required page, note the information that you will be required to specify, then click *Continue*.
4. On the Novell Customer Center Registration page, specify the required information in the following fields, then click *Submit*:

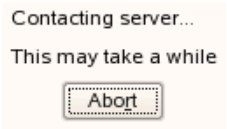
Field	Information to Specify
Email Address	The e-mail address for your Novell Login account.
Confirm Email Address	The same e-mail address for your Novell Login account
Activation Code for SLES Components (optional):	Specify your purchased or 60-day evaluation registration code for the SLES 10 product. If you don't specify a code, the server cannot receive any updates or patches.

Field	Information to Specify
Activation Code for OES Components (optional):	Specify your purchased or 60-day evaluation registration code for the OES 2 product. If you don't specify a code, the server cannot receive any updates or patches.
System Name or Description (optional):	Specify a description to identify this server.

5 When the message to complete the registration displays, click *Continue*.

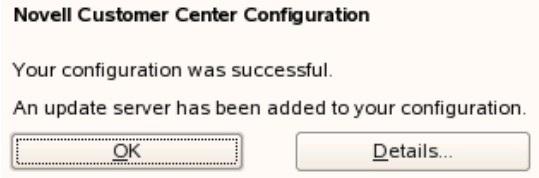


6 After you click *Continue*, the following message is displayed with the Manual Interaction Required screen.



Wait until this message disappears and Novell Customer Center Configuration page displays.

7 When you see the message `Your configuration was successful` on the Novell Customer Center Configuration page, click *OK*.



8 Continue with “Updating the Server Software During the Installation” on page 60.

Updating the Server Software During the Installation

If you have a successful connection to the Internet and have registered the server in the Novell Customer Center, the server displays the Online Update dialog. You can run the online update now or skip it and get updates later.

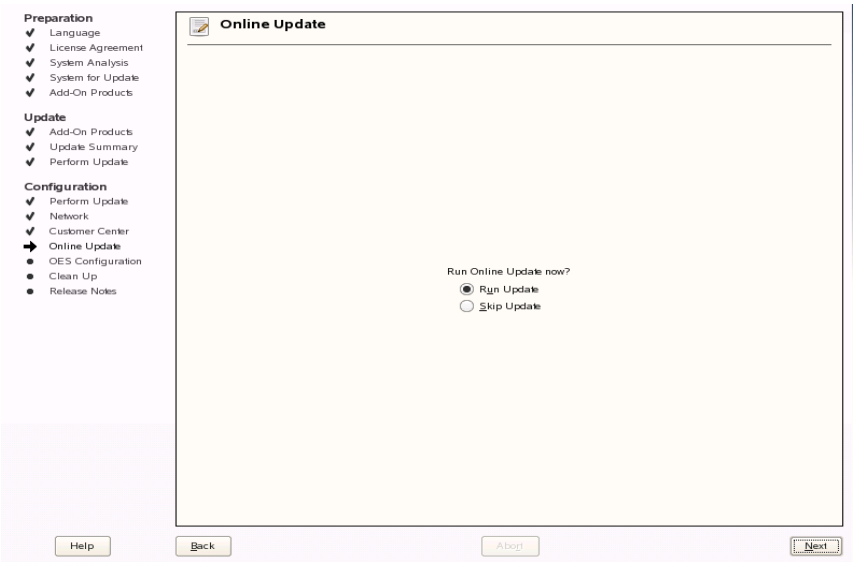
To skip getting updates during the installation:

1 On the Online Update page, click *Skip Update*.

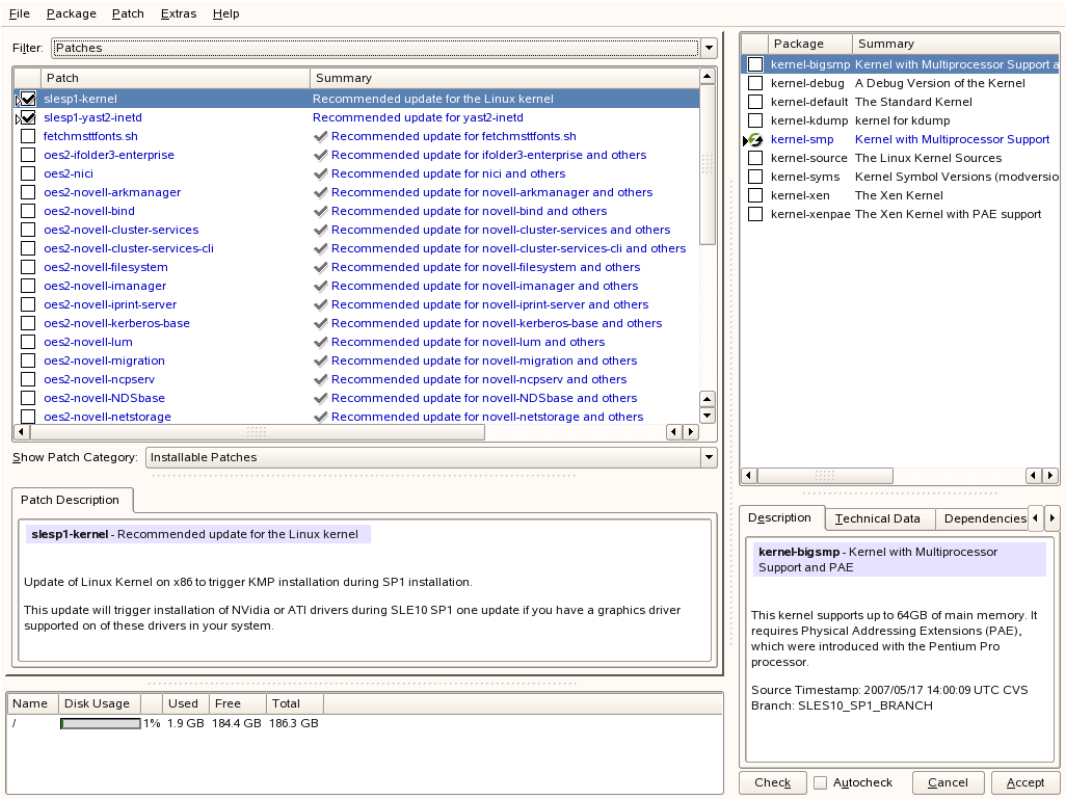
2 Continue with “Specifying Service Configuration Settings” on page 63.

To get updates during the installation:

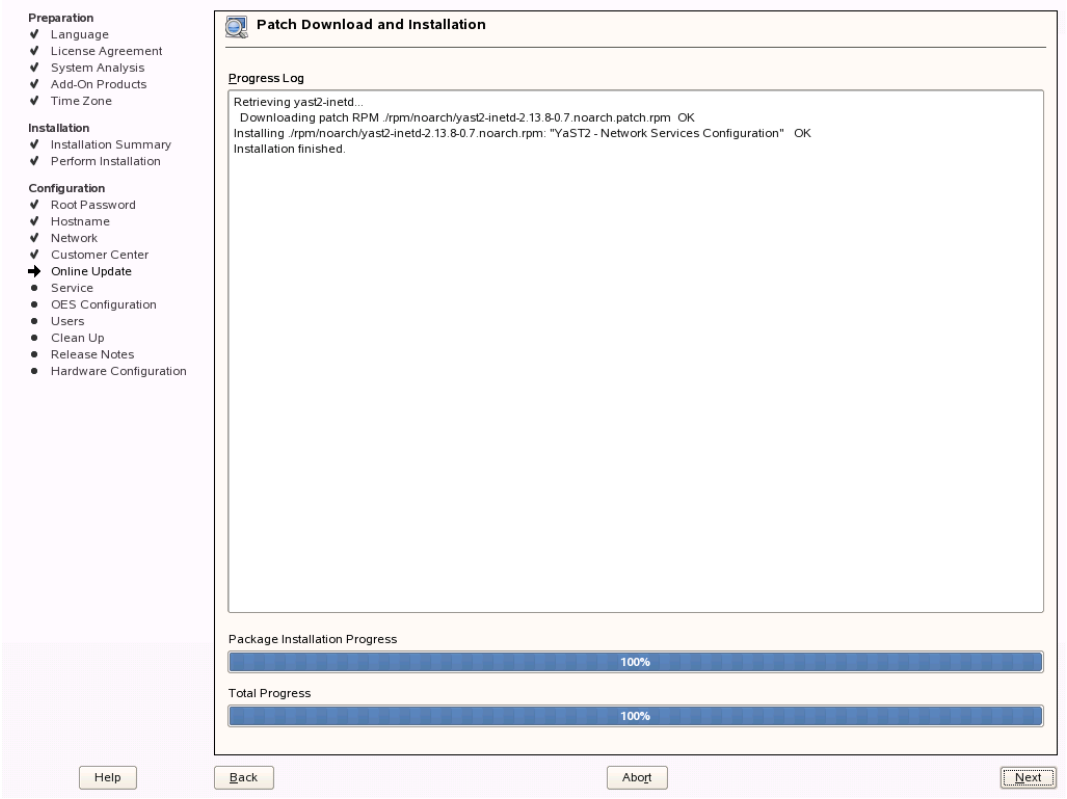
1 In the Online Updates dialog, click *Run Update*.



2 On the page that shows that updates are available, select the updates that you want to install, then click *Accept*. The check marks that are shown on the summary portion of the page are patches that have already been installed on your system.



3 When you see the message, `Installation finished` on the Patch Download and Installation page, click *Next*.

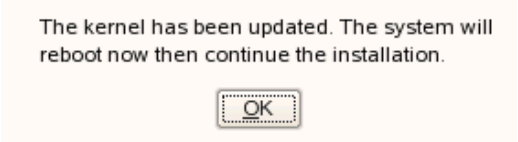


4 If the update makes changes to YaST, the following message displays. Click *OK* to restart YaST.

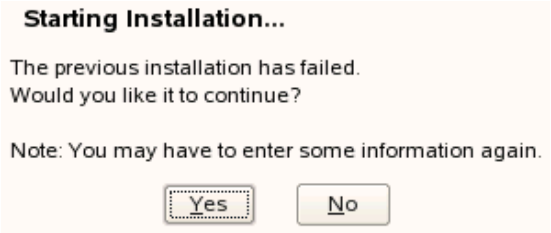
5 Because the installation was interrupted, the following message displays. Click *Yes* to continue with the installation.

6 The online update displays again with additional updates. If a patch has changes to the kernel, you might want to deselect it and install it later after the installation is complete. For procedures, see "Updating (Patching) an OES 2 SP2 Server" on page 149.

If you do install patches that have changes to the kernel, click *OK* when you see the following message.



7 Because the installation was interrupted again, the following message displays. Click *Yes* to continue with the installation.



8 After all the patches are installed, continue with "Specifying Service Configuration Settings" on page 63.

Specifying Service Configuration Settings

1 In the *Installation Settings* page, select or deselect the following options:

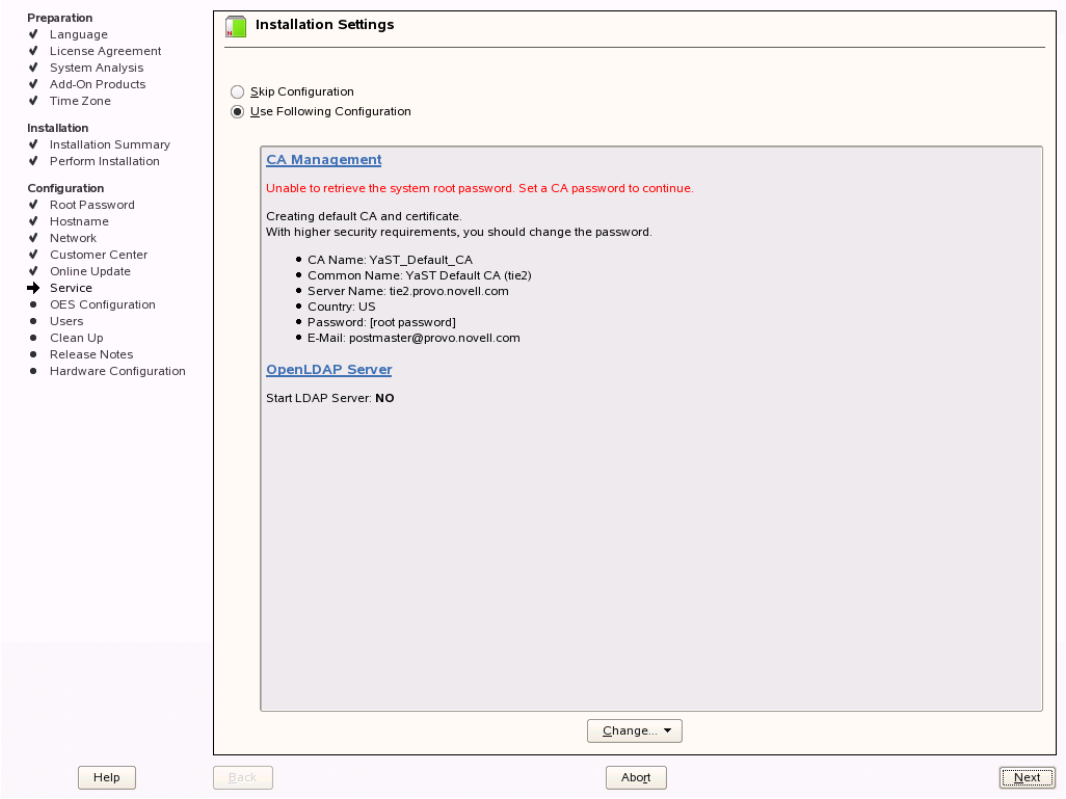
CA Management: You can accept the default settings or change the settings for a greater security level.

The certificate that is created is used by the Apache Web server. If you disable this configuration, each service that uses Apache will not work. The option to run the CA Management configuration is selected by default.

For more information about Certificate Authority Management, see in the "Managing X.509 Certification" in the *SUSE LINUX Enterprise Server 10 Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/cha_yast_ca.html).

Do Not Enable OpenLDAP Server: Because the Novell eDirectory LDAP server replaces the SLES 10 OpenLDAP server, you must not enable this option. It is disabled by default.

2 If you updated the server during the installation, the default settings for CA management loses the root password. You need to reset the password for `root` in this dialog's settings.



2a On the Installation Settings page, click the *CA Management* link.

2b On the Managing CA and Certificates page, click *Edit Default Settings*.

2c On the Edit Default Settings page, enter the password for `root` in the Password and Confirm Password fields, then click *Next*.

3 When the setting are as desired, click *Next* and continue with one of the applicable procedures as follows:

- "Specifying LDAP Configuration Settings" on page 64.
- "Specifying eDirectory Configuration Settings" on page 66.

Specifying LDAP Configuration Settings

Many of the OES services require eDirectory. If eDirectory was not selected as a product to install on this server but other OES services that do require LDAP services were installed, the LDAP Configuration service displays expecting you to in complete the required information.

To specify the required information on the Configured LDAP Server page:

1 In the *eDirectory Tree Name* field, specify the name for the existing eDirectory tree that you are installing this server into.

2 In the *Admin Name and Context* field, specify the name and context for user Admin in the existing tree.

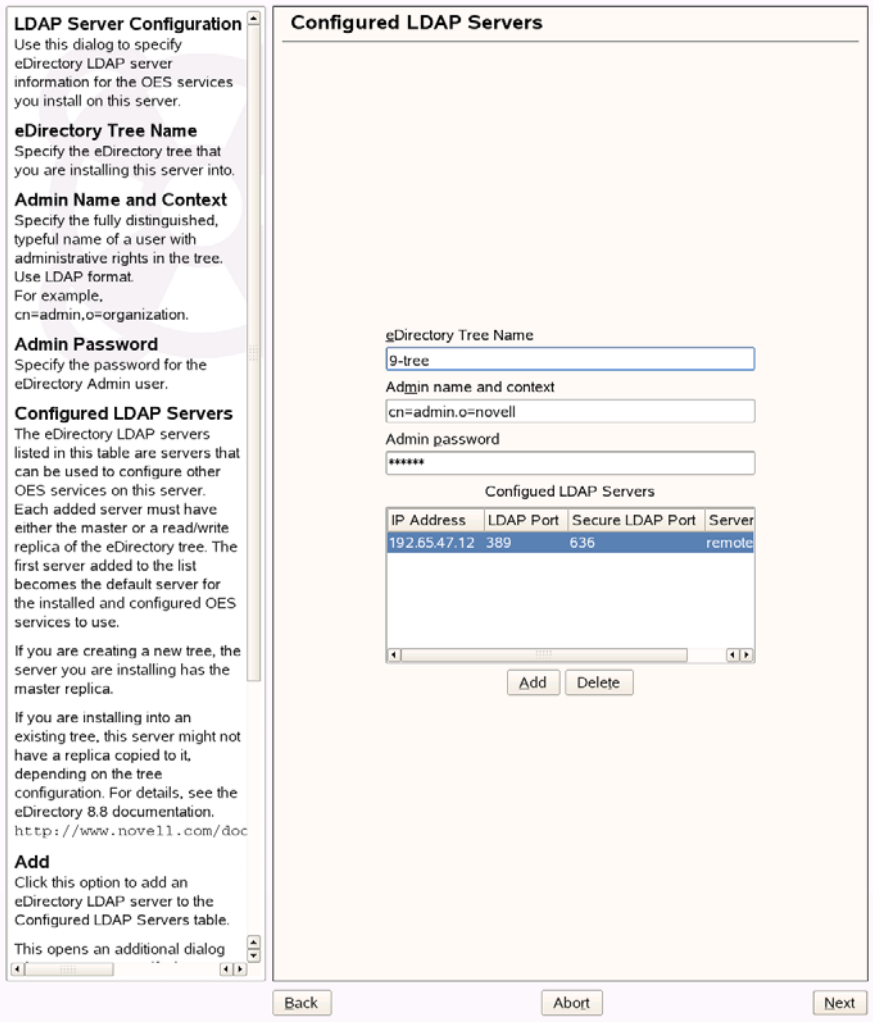
3 In the *Admin Password Name* field, specify a password for user for user Admin in the existing tree.

4 Add the LDAP servers that you want the services on this server to use. The servers that you add should hold the master or a read/write replica of eDirectory. Do the following for each server you want to add.

4a Click *Add*.

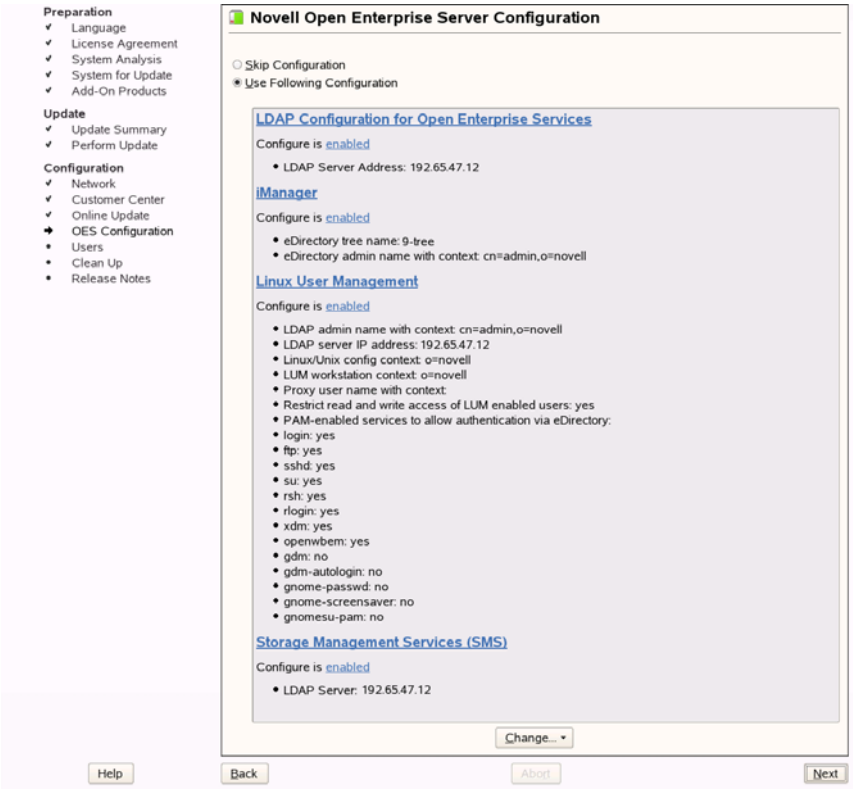
4b On the next dialog, specify the following information for the server to add, then click *Add*.

- IP Address
- LDAP port and secure LDAP port



5 When all the LDAP servers that you want to specify are listed, click *Next*.

6 Verify that the Novell Open Enterprise Server Configuration page displays the settings that you expected, then click *Next*.



7 Continue with “Configuring Novell Open Enterprise Server Services” on page 70.

Specifying eDirectory Configuration Settings

When specifying eDirectory Configuration Settings, you can specify information to create a new tree and install the server in that new tree or you can install the server into an existing tree by specifying the information for it. Use the following instructions as applicable:

- “Creating a New eDirectory Tree and Installing the Server in It” on page 66
- “Installing the Server into an Existing eDirectory Tree” on page 67

Creating a New eDirectory Tree and Installing the Server in It

1 On the eDirectory Configuration - New or Existing Tree page, select *New Tree*.

2 In the eDirectory Tree Name field, specify a name for the eDirectory tree that you want to create.

3 Services that provide HTTPS connectivity are configured to use either an eDirectory certificate or the YaST self-signed common server certificate created in Step 1 on page 63.

The *Use eDirectory Certificates for HTTPS Services* check box is selected by default so that the existing YaST server certificate and key files will be replaced with eDirectory server certificate and key files.

Because self-signed certificates provide minimal security and limited trust, you should consider using eDirectory certificates instead.

The default YaST server certificate and key files are:

- Key file: `/etc/ssl/servercerts/serverkey.pem`
- Certificate file: `/etc/ssl/servercerts/servercert.pem`

The eDirectory server certificate and key files are:

- Key file: `/etc/ssl/servercerts/eDirkey.pem`
- Certificate file: `/etc/ssl/servercerts/eDircert.pem`

For more information on certificate management, see "Certificate Management" in the *OES 2 SP2: Planning and Implementation Guide*.

4 In the following fields on the eDirectory Configuration - New Tree Information dialog, specify the required information.

- The fully distinguished name and context for the user Admin on the existing server
- The password for user Admin on the existing server.

5 Click *Next*.

6 In the eDirectory Configuration - Local Server Configuration dialog, specify the following information:

- The context for the server object in the eDirectory tree.
- A location for the eDirectory database.

  The default path is /var/opt/novell/eDirectory/data/dib, but you can use this option to change the location if you expect the number of objects in your tree to be large and the current file system does not have sufficient space.
- The ports to use for servicing LDAP requests.

  The default ports are 389 non-secure and 636 secure.
- The ports to use for providing access to the iMonitor application.

  The default ports are 8028 non-secure and 8030 secure.

7 Click *Next* and continue with "Specifying Synchronizing Server Time Options" on page 68.

Installing the Server into an Existing eDirectory Tree

1 In the eDirectory Configuration - New or Existing Tree screen, select *Existing Tree*.

2 In the *eDirectory Tree Name* field, specify a name for the eDirectory tree you want to join.

3 Services that provide HTTPS connectivity are configured to use either an eDirectory certificate or the YaST self-signed common server certificate created in Step 1 on page 63.

The *Use eDirectory Certificates for HTTPS Services* check box is selected by default so that the existing YaST server certificate and key files will be replaced with eDirectory server certificate and key files.

Because self-signed certificates provide minimal security and limited trust, you should consider using eDirectory certificates instead.

The default YaST server certificate and key files are:

- Key file: `/etc/ssl/servercerts/serverkey.pem`
- Certificate file: `/etc/ssl/servercerts/servercert.pem`

The eDirectory server certificate and key files are:

- Key file: `/etc/ssl/servercerts/eDirkey.pem`
- Certificate file: `/etc/ssl/servercerts/eDircert.pem`

For more information on certificate management, see "Certificate Management" in the *OES 2 SP2: Planning and Implementation Guide*.

4 In the following fields on the eDirectory Configuration - Existing Tree Information dialog, specify the required information.

- The IP address of an existing eDirectory server with a replica
- The NCP port on the existing server
- The LDAP and secure LDAP port on the existing server.
- The fully distinguished name and context for the user Admin on the existing server
- The password for user Admin on the existing server.

5 Click *Next*.

6 In the eDirectory Configuration - Local Server Configuration dialog, specify the following information:

- The context for the server object in the eDirectory tree.
- A location for the eDirectory database.

  The default path is /var/opt/novell/eDirectory/data/dib, but you can use this option to change the location if you expect the number of objects in your tree to be large and the current file system does not have sufficient space.
- The ports to use for servicing LDAP requests.

  The default ports are 389 non-secure and 636 secure.
- The ports to use for providing access to the iMonitor application.

  The default ports are 8028 non-secure and 8030 secure.

7 Click Next and continue with "Specifying Synchronizing Server Time Options" on page 68.

Specifying Synchronizing Server Time Options

eDirectory requires that all OES servers, both NetWare and Linux, are time-synchronized.

1 In the eDirectory Configuration - NTP & SLP page, use the Network Time Protocol (NTP) Server field to specify the time source that you want all the servers in the tree to use.

Specify the IP address or DNS hostname of an NTP server.

For the first server in a tree, we recommend specifying a reliable, external time source.

When installing multiple servers in to the same eDirectory tree, make sure that all servers point to the same time source and not to server holding the master replica. For example, time.novell.com or some other time source.

For servers joining a tree, specify the same external NTP time source that the tree is using, or specify the IP address of a configured time source in the tree. A time source in the tree should be running time services for 15 minutes or more before connecting to it, or the time synchronization request for the installation fails.

If the time source server is NetWare 5.0 or earlier, you must specify an alternate NTP time source, or the time synchronization request fails.

2 If you want to use the server's hardware clock, select *Use Local Clock*.

For servers joining a tree, the installation does not let you proceed if you select this option. You must specify the same external NTP time source that the tree is using, or specify the IP address of a configured time source in the tree. A time source in the tree should be running time services for 15 minutes or more before connecting to it, or the time synchronization request for the installation fails.

3 Continue with "Specifying SLP Configuration Options" on page 69.

For information on this important topic, see Implementing Time Synchronization in the *OES 2 SP2: Planning and Implementation Guide*.

Specifying SLP Configuration Options

1 On the eDirectory Configuration - NTP & SLP page, specify the SLP options as desired.

You have the following options for configuring SLP:

- **Do Not Configure SLP:** This option is good for eDirectory trees with three or fewer eDirectory servers.

  Without SLP, users can't see a tree list, but they should still be able to attach to a tree by name. Users can configure the Novell Client™ to use DNS, or they can configure the local host file (`%SystemDrive%\windows\system32\drivers\etc\hosts` on WinXP) to resolve tree and server names. Users can also specify preferred tree and context information in the DHCP Settings page of the Novell Client.

- **Use Multicast to Access SLP:** This option allows the server to request SLP information by using multicast packets. Use this in environments that have not established SLP DAs (Directory Agents).

  IMPORTANT: If you select this option, you must disable the firewall for it to work correctly. Multicast creates a significant amount of network traffic and can reduce network throughput.

- **Configure SLP to use an existing Directory Agent:** This option configures SLP to use an existing Directory Agent (DA) in your network. Use this in environments that have established SLP DAs. When selecting this option, you configure the servers to use by adding or removing them from the SLP Directory Agent list.
- **Configure as Directory Agent:** This option configures this server as a Directory Agent (DA). This is useful if you plan to have more than three servers in the tree and want to set up SLP during the installation.
- **Service Location Protocols and Scope:** This option configures the scopes that a user agent (UA) or service agent (SA) is allowed when making requests or when registering services, or specifies the scopes a directory agent (DA) must support. The default value is DEFAULT. Use commas to separate each scope. For example, net.slp.useScopes = myScope1,myScope2,myScope3.
- **Configured SLP Directory Agents:** This option lets you manage the list of hostname or IP addresses of one or more external servers on which a SLP Directory Agent is running.

2 Click *Next* and confirm your selection if necessary, then continue with Selecting the Novell Modular Authentication Services (NMAS) Login Method.

Selecting the Novell Modular Authentication Services (NMAS) Login Method

1 On the *Novell Modular Authentication Services* page, select all the login methods you want to install.

IMPORTANT: The NMAS™ client software must be installed on each client workstation where you want to use the NMAS login methods. The NMAS client software is included with the Novell Client software.

The following methods are available:

- **CertMutual:** The Certificate Mutual login method implements the Simple Authentication and Security Layer (SASL) EXTERNAL mechanism, which uses SSL certificates to provide client authentication to eDirectory through LDAP.
- **Challenge Response:** The Challenge-Response login method works with the Identity Manager password self-service process. This method allows either an administrator or a user to define a password challenge question and a response, which are saved in the password policy. Then, when users forget their passwords, they can reset their own passwords by providing the correct response to the challenge question.
- **DIGEST-MD5:** The Digest MD5 login method implements the Simple Authentication and Security Layer (SASL) DIGEST-MD5 mechanism as a means of authenticating the user to eDirectory through LDAP.
- **NDS:** The NDS® login method provides secure password challenge-response user authentication to eDirectory. This method supports the traditional NDS password when the NMAS client is in use and is installed by default. Reinstallation is necessary only if the NDS login method object has been removed from the directory.
- **Simple Password:** The Simple Password NMAS login method provides password authentication to eDirectory. The Simple Password is a more flexible but less secure alternative to the NDS password. Simple Passwords are stored in a secret store on the user object.
- **SASL GSSAPI:** The SASL GSSAPI login method implements the Generic Security Services Application Program Interface (GSSAPI) authentication. It uses the Simple Authentication and Security Layer (SASL), which enables users to authenticate to eDirectory through LDAP by using a Kerberos ticket.

For more information about installing and configuring eDirectory, see "Installing or Upgrading Novell eDirectory on Linux in *Novell eDirectory 8.8 Installation Guide*.

For more information on these login methods, see the online help and "Managing Login and Post-Login Methods and Sequences" in the *Novell Modular Authentication Services 3.3.1 Administration Guide*.

2 Click *Next*, then continue with "Configuring Novell Open Enterprise Server Services" on page 70.

Configuring Novell Open Enterprise Server Services

1 After you complete the LDAP configuration or the eDirectory configuration, the *Novell Open Enterprise Server Configuration* summary page is displayed, showing all the OES components you installed and their configuration settings. Review the setting for each component and click the component heading to change any settings.

When specifying the configuration information for OES services, see the information in "Guidelines for Configuring OES 2 SP2 Components" on page 73.

2 When you are satisfied with the settings for each component, click *Next*.

3 When confirming the OES component configurations, you might receive the following error:

```
The proposal contains an error that must be resolved before continuing.
```

If this error is displayed, check the summary list of configured products for a message immediately below each product heading that indicates the product or service needs to be configured. If you are running the YaST graphical interface, the text appears red. If you are installing using the YaST text-base interface, it is not red.

For example, if you have selected Linux User Management in connection with other OES products or services, you might see a message similar to the following:

```
Linux User Management needs to be configured before you can continue or
disable the configuration.
```

If you see a message like this, do the following:

3a On the summary page, click the heading for the component.

3b Supply the missing information in each configuration page.

When specifying the configuration information for OES services, see the information in "Guidelines for Configuring OES 2 SP2 Components" on page 73.

When you have finished the configuration of that component, you are returned to the *Novell Open Enterprise Server Configuration* summary page.

3c If you want to skip the configuration of a specific component and configure it later, click *Enable*d in the *Configuration is enabled* status to change the status to *Configuration is disabled*.

If you change the status to *Configuration is disabled*, you will configure the OES components after the installation is complete. See "Installing/Configuring OES 2 SP2 on an Existing Server" on page 107.

4 After resolving all product configuration problems, click *Next* to proceed with the configuration of all components.

5 When the configuration has completed, continue with Section 3.4, "Finishing the Installation," on page 71.

3.4 Finishing the Installation

The installation concludes with the following steps:

1. User Authentication Method
2. Clean Up
3. Release Notes
4. Hardware Configuration

After a successful configuration, YaST shows the Installation Completed dialog. In this dialog, do the following:

1 Optionally, select whether to clone your newly installed system for AutoYaST. To clone your system, select *Clone This System for AutoYaST*. The profile of the current system is stored in `/root/autoinst.xml`. Cloning is selected by default.

AutoYaST is a system for automatically installing one or more SUSE Linux Enterprise systems without user intervention. AutoYaST installations are performed by using a control file with installation and configuration data. For detailed information, see Chapter 8, “Using AutoYaST to Install and Configure Multiple OES Servers,” on page 169.

2 Finish the installation by clicking *Finish* in the Installation Completed dialog.

3 After the server reboots, continue with Section 3.5, “Verifying That the Installation Was Successful,” on page 72.

3.5 Verifying That the Installation Was Successful

One way to verify that your OES server installation was successful and that the components are loading properly is to watch the server reboot. As each component is loaded, the boot logger provides a status next to it indicating if the component is loading properly.

You can also quickly verify a successful installation by accessing the server from your Web browser.

1 In the Address field of your Web browser, enter the following URLs:

http://*IP_or_DNS*

where *IP_or_DNS* is the IP address or DNS name of your OES server.

You should see a Web page displayed similar to the following:

IMPORTANT: If you see the statement "It Works!" instead of the OES Welcome Page, that means that the Web and LAMP Server option was selected and installed as a SLES component on the server. The default OES behavior can be restored by deleting the `/srv/www/htdocs/index.html` file from the server.

You can also view the OES Welcome Page by using http://*IP_or_DNS*/welcome to access the server.

2 (Optional) If you want to look at the eDirectory tree and begin to see how iManager works, go to the OES Information and Management Web page, click *Management Tools* > *iManager*, then log in as user Admin (the user you created during product installation).

You can also access iManager by typing the following URL in a browser window and logging in as user Admin:

`http://IP_or_DNS_name/nps/iManager.html`

3 Continue with "What's Next" on page 105.

3.6 Guidelines for Configuring OES 2 SP2 Components

Keep the following in mind as you configure the OES 2 SP2 components:

Table 3-4 *Guidelines for Configuring OES Components*

Issue	Guideline
Software Selections When Using Text-Based YaST	Some older machines, such as Dell* 1300, use the text mode install by default when the video card does not meet SLES 10 specifications. When you go into the *Software Selection*, and then to the details of the OES software selections, YaST doesn't bring up the OES selections like it does when you use the graphical YaST (YaST2). To view the Software Selection and System Task screen, select *Filter* > *Pattern* (or press Alt+F > Alt+I).

Specifying a State identifier for a Locality Class object	If you to specify a state identifier, for example California, Utah, or Karnataka, as a Locality Class object in your eDirectory tree hierarchy, you must make sure to use the correct abbreviation in your LDAP (comma-delimited) or NDAP (period-delimited) syntax.
	
	When using LDAP syntax, use "st" to specify a state. For example
	
	`ou=example_organization,o=example_company,st=utah,c=us`
	
	When using NDAP syntax, use "s" to specify a state. For example
	
	`ou=example_organization.o=example_company.s=utah.c=us`

Specifying Typeful Admin Names	When installing OES, you must specify a fully distinguished admin name by using the typeful, LDAP syntax that includes object type abbreviations (cn=, ou=, o=, etc.). For example, you might specify the following: `cn=admin,ou=example_organization,o=example_company`

Issue	Guideline

Using Dot-Delimited or Comma-Delimited Input for All Products	For all parameters requiring full contexts, you can separate the names by using comma-delimited syntax; you must be consistent in your usage within the field.
	
	The OES installation routine displays all input in the comma-delimited (LDAP) format. However, it converts the name separators to dots when this is required by individual product components.
	
	IMPORTANT: After the OES components are installed, be sure to follow the conventions specified in the documentation for each product. Some contexts must be specified using periods (.) and others using commas (,). However, eDirectory supports names like cn=juan\.garcia.ou=users.o=novell. The period (.) inside a name component must be escaped.
	
	When using NDAP format (dot), you must escape all embedded dots. For example:`cn=admin.o=novell\.provo`
	
	When using LDAP format (commas), you must escape all embedded commas. For example:`cn=admin,o=novell\,provo`
	
	The installation disallows a backslash and period (\.) in the CN portion of the admin name.
	
	For example, these names are supported:
	
	`cn=admin.o=novell`
	`cn=admin.o=novell\.provo`
	`cn=admin.ou=deployment\.linux.o=novell\.provo`
	
	These names are not supported:
	
	`cn=admin\.first.o=novell`
	`cn=admin\.root.o=novell`
	
	Before LUM-enabling users whose cn contains a period (.), you must remove the backslash (\) from the unique_id field of the User object container.
	
	For example, cn=juan.garcia has a unique_id attribute = juan\.garcia. Before such a user can be LUM-enabled, the backslash (\) must be removed from the unique_id attribute.

Each OES component and the configurable fields associated with it are listed in the following sections. These components also include the default or previously entered values, where applicable. Some components might require some additional configuration as part of the OES installation; this information is also included in the tables.

The following sections list the specific configuration information required for each component:

- Section 3.6.1, “LDAP Configuration for Open Enterprise Services,” on page 75
- Section 3.6.2, “Novell AFP Services,” on page 76
- Section 3.6.3, “Novell Archive and Version Services,” on page 77
- Section 3.6.4, “Novell Backup/Storage Management Services (SMS),” on page 78
- Section 3.6.5, “Novell CIFS for Linux,” on page 78
- Section 3.6.6, “Novell Cluster Services,” on page 80
- Section 3.6.7, “Novell DHCP Services,” on page 82

3.6.1 LDAP Configuration for Open Enterprise Services

Table 3-5 *LDAP Configuration for Open Enterprise Services Values*

Page Parameter	Default or Previously Entered Values
Configured LDAP Servers	
◆ **eDirectory Tree Name:** Specify the new eDirectory tree name (default) or the name of eDirectory tree you are installing the server into.	
◆ **Admin Name and Context:** Specify the fully distinguished, typeful name of a user with administrative rights in the tree. Use LDAP format.	cn=admin,o=novell
◆ **Admin Password:** Specify a password for the eDirectory Admin user.	

Page	Parameter	Default or Previously Entered Values
	◆ **Configured LDAP Servers:** Specify a list of servers that can be used to configure other OES services on this server. Each added server must have either the master or a read/write replica of the eDirectory tree. The first server added to the list becomes the default server for the installed and configured OES services to use. For each server you must specify an IP Address, LDAP Port, Secure LDAP Port, and Server Type <Defect 332088 requests information on configuring multiple LDAP servers for LUM, a primary and alternates. This is being added to the LUM documentation and should be linked here for those who are installing LUM.>	LDAP port: 389 Secure LDAP port: 636 Server Type: local

3.6.2 Novell AFP Services

Table 3-6 *Novell Apple Filing Protocol Parameters and Values*

Page	Parameter	Default or Previously Entered Values
AFP Configuration - Mac Client Access to NSS Volumes		
	◆ **eDirectory Server Address or Host Namer:** The IP address shown is the default LDAP server for this service. If you do not want to use the default, select a different LDAP server in the list. If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you need to add another LDAP server to the list, add it using the LDAP Configuration for Open Enterprise Services dialog.	

Page	Parameter	Default or Previously Entered Values

	• **AFP Proxy User**
	  • **Use existing user as AFP Proxy User:** Select this option to use an existing proxy user for the AFP service.
	  • **Create a new AFP Proxy User:** Select this option to create a new proxy user for the AFP service.
	  • **AFP Proxy User Name:** Specify the FQDN (fully qualified distinguished name) of the AFP proxy user.
	  For example: cn=user, o=novell
	  NOTE: This user is granted rights to read the passwords of any users, including non-AFP users, that are governed by any of the password policies you select in the Novell AFP Service Configuration page.
	  • **AFP Proxy User Password:** Specify a password for the AFP proxy user to use for authenticating to the AFP server, and if specifying an existing proxy user, verify the password.
	  For more information on proxy user and password management, see "Planning Your Proxy Users" in the *OES 2 SP2: Planning and Implementation Guide*.	

Novell AFP Service Configuration		

	• **Select the Password Policies Assigned to AFP Users:**
	  The specified AFP Proxy User is granted rights to read the passwords of all users assigned to the password policies you select.
	  If you are installing in a new tree, the list is blank. The install will create a policy named AFP Default Policy for you.
	  For more information about proxy users and password policies, see "System User and Group Management in OES 2 SP2" and "Coordinating Password Policies Among Multiple File Services" in the *OES 2 SP2: Planning and Implementation Guide*.	

For additional configuration instructions, see "Installing and Setting Up AFP" in the *OES 2 SP2: Novell AFP For Linux Administration Guide*

3.6.3 Novell Archive and Version Services

Table 3-7 *Novell Archive and Version Services Parameters and Values*

Page	Parameter	Default or Previously Entered Values
Archive and Version Services Configuration		

Page Parameter	Default or Previously Entered Values
◆ **Database Port Number:** Specify a port number to use for the archive database communications.	5432
◆ **Database Username:** Specify a username for the administrator of the archive database (the PostgreSQL database for the archived data). **IMPORTANT:** The Postgres user must be an unprivileged user, not the root user.	arkuser
◆ **Database Password:** Specify and validate a password for the database user.	The default is the password for the eDirectory Admin user.

For additional configuration instructions, see "Setting Up Archive and Version Services " in the *OES 2 SP1: Novell Archive and Version Services 2.1 for Linux Administration Guide*.

3.6.4 Novell Backup/Storage Management Services (SMS)

Table 3-8 *Novell Backup / Storage Management Services Parameters and Values*

Page Parameter	Default or Previously Entered Values
SMS Configuration	
◆ **Directory Server Address:** If you do not want to use the default shown, select a different LDAP server in the list. If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you need to add another LDAP server to the list, add it by using the LDAP Configuration for Open Enterprise Services dialog.	The default is the first server selected in the *LDAP Configuration* list of servers.

For additional configuration instructions, see "Installing and Configuring SMS" in the *Installing and Configuring SMS*.

3.6.5 Novell CIFS for Linux

Table 3-9 *Novell CIFS Parameters and Values*

Page Parameter	Default or Previously Entered Values
Novell CIFS Service Configuration	
◆ **eDirectory server address or host name:** Leave the default or select from the drop-down list to change to a different server.	

Page	Parameter	Default or Previously Entered Values
	◆ **Use secure channel for configuration:** Leave this option as is (preferred), or deselect if desired.	Selected
	◆ **LDAP port for CIFS Server:** Do not change the default port value during a new tree installation. **NOTE:** If the OES 2 server is attached to an existing tree, you can change this to another LDAP port.	636
	◆ **Local NCP Server context:** Displays the NCP™ Server context.	
	◆ **CIFS Proxy User** ◆ **Use existing user as CIFS Proxy User:** Select this option to use an existing proxy user for the CIFS service. ◆ **Create a new CIFS Proxy User:** Select this option to create a new proxy user for the CIFS service. ◆ **CIFS Proxy User Name:** Specify the FQDN (fully qualified distinguished name) of the CIFS proxy user. For example: cn=user, o=novell **NOTE:** This user is granted rights to read the passwords of any users, including non-CIFS users, that are governed by any of the password policies you select in the Novell CIFS Service Configuration page. ◆ **CIFS Proxy User Password:** Specify a password for the CIFS proxy user to use when authenticating to the CIFS server, and if specifying an existing proxy user, verify the password. For more information on proxy user and password management, see "Planning Your Proxy Users" in the *OES 2 SP2: Planning and Implementation Guide*.	
	◆ **Credential Storage Location:** Accept the default (CASA) or specify the *Local File* option. The CIFS proxy user password is encrypted and encoded in the credential storage location.	CASA
Novell CIFS Service Configuration (2)		
	◆ **eDirectory Contexts:** Provide a list of contexts that are searched when the CIFS User enters a username. The server searches through each context in the list until it finds the correct user object.	
Novell CIFS Service Configuration (3)		

Page	Parameter	Default or Previously Entered Values
	◆ **Select the Password Policies Assigned to CIFS Users:** The specified CIFS Proxy User is granted rights to read the passwords of all users assigned to the password policies you select. If you are installing in a new tree, the list is blank. The install will create a policy named CIFS Default Policy for you. For more information about proxy users and password policies, see "System User and Group Management in OES 2 SP2" and "Coordinating Password Policies Among Multiple File Services" in the *OES 2 SP2: Planning and Implementation Guide*.	

For additional configuration instructions, see "Installing and Setting Up CIFS" in the *OES 2 SP2: Novell CIFS for Linux Administration Guide OES 2 SP2: Novell AFP For Linux Administration Guide*

3.6.6 Novell Cluster Services

Table 3-10 *Novell Cluster Services Parameters and Values*

Page	Parameter	Default or Previously Entered Values
Novell Cluster Services (NCS) Configuration		
	◆ **New or Existing Cluster:** Specify whether the server is part of a new cluster or is joining an existing cluster.	New Cluster
	◆ **Directory Server Address:** The IP address shown is the default LDAP server for this service. If you do not want to use the default, select a different LDAP server in the list. If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you need to add another LDAP server to the list, add it by using the LDAP Configuration for Open Enterprise Services dialog.	The default is the first server selected in the *LDAP Configuration* list of servers.

Page	Parameter	Default or Previously Entered Values
	◆ **Cluster FDN:** Specify the fully distinguished name (FDN) of the cluster. Use the comma format illustrated in the example. Do not use dots. If you are creating a new cluster, this is the name you will give the new cluster and the eDirectory context where the new cluster object will reside. You must specify an existing context. Specifying a new context does not create a new context. If you are adding a server to an existing cluster, this is the name and eDirectory context of the cluster that you are adding this server to. Cluster names must be unique. You cannot create two clusters with the same name in the same eDirectory tree. Cluster names are case sensitive on Linux.	
	◆ **Cluster IP Address:** If you are creating a new cluster, specify a unique IP address for the cluster. The cluster IP address is separate from the server IP address and is required to be on the same IP subnet as the other servers in the cluster.	
	◆ **Storage Device With Shared Media:** If you are creating a new cluster, select the device where the Split Brain Detector (SBD) partition will be created. If you have a shared disk system attached to your cluster servers, Novell Cluster Services will create a small cluster partition on that shared disk system. This small cluster partition is referred to as the Split Brain Detector (SBD) partition. Specify the drive or device where you want the small cluster partition created. You must have at least 20 MB of free space on one of the shared disk drives to create the cluster partition. If no free space is available, the shared disk drives cannot be used by Novell Cluster Services. If you do not have a shared disk system connected to your cluster servers, accept the default (none). You must create the SBD manually before adding a second server to the cluster.	none
	◆ **Optional Device for Mirrored Partitions:** If you want to mirror the SBD partition for greater fault tolerance, select the device where you want to mirror to. You can also mirror SBD partitions after installing Novell Cluster Services.	
Novell Cluster Services (NCS) Configuration (2)		
	◆ **IP Address of this Node:** This field contains the IP address of this node. If this server has multiple IP addresses, you can change the default address to another value if desired.	

Page	Parameter	Default or Previously Entered Values
	◆ **Start Cluster Services Now:** Select this box if you want clustering to start now. If you want clustering to start after rebooting, or if you want to manually start it later, deselect this box. This option applies only to installing Novell Cluster Services after the OES installation because it starts automatically when the server initializes during the installation. If you choose to not start Novell Cluster Services software, you need to either manually start it after the installation, or reboot the cluster server to automatically start it. You can manually start Novell Cluster Services by going to the `/etc/init.d` directory and entering `./novell-ncs start` at the server console of the cluster server.	Selected

For additional instructions, see the *OES 2 SP2: Novell Cluster Services 1.8.7 for Linux Administration Guide*.

3.6.7 Novell DHCP Services

Table 3-11 *Novell DHCP Services Parameters and Values*

Page	Parameter	Default or Previously Entered Values
Novell DHCP Services Configuration		
	◆ **DHCP Server Context:** Specify a context for the DHCP Server object.	o=example
	◆ **DHCP Server Object Name:** Specify the name of the Server object that these DHCP services will be running on. This is the DHCP server object that contains a list of DHCP Services (configuration) served by the DHCP Server.	DHCP_example_server
	◆ **Common DHCP Configuration Object Contexts** ◆ **DHCP Locator Object:** Specify the context for the DHCP Locator object. The DHCP Locator object has references to dhcpServer and dhcpService objects. ◆ **Group Context:** Specify the context for the DHCP Group object. This object is used to grant the necessary rights to the eDirectory user used by the DHCP server to access the DHCP objects.	o=example
	◆ **Log File Location:** Specify the path and filename for the DHCP Services log file. You can type the path manually or click *Browse* to locate the log.	It is usually in the `/var/log/` directory.

Page	Parameter	Default or Previously Entered Values
	◆ **LDAP Method** ◆ **Static:** Select this option if you do not want the DHCP server to query the LDAP server for host details. ◆ **Dynamic:** Select this option if you want the DHCP server to query the LDAP server on every request for host details. Selecting the dynamic LDAP method ensures that the responses you receive to queries are accurate, but the server takes a longer time to respond.	Static
	◆ **Referrals** A referral is a message that the LDAP server sends to the LDAP client informing it that the server cannot provide complete results and that more data might be on another LDAP server. ◆ **Chase Referral:** Select this option if you want the DHCP server to follow referrals. ◆ **Do Not Chase Referral:** Select this option to ignore LDAP referrals.	
Novell DHCP LDAP and Secure Channel Configuration		
	◆ **eDirectory Server Address or Host Name:** The IP address shown is the default LDAP server for this service. If you do not want to use the default, select a different LDAP server in the list. If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you need to add another LDAP server to the list, add it by using the LDAP Configuration for Open Enterprise Services dialog.	The default is the first server selected in the *LDAP Configuration* list of servers.
	◆ **Use Secure Channel for Configuration:** This option is selected by default. When you are configuring DHCP services, it ensures that all configuration is transferred over a secure channel. Deselecting this option lets a user with fewer privileges configure LDAP services.	Selected
	◆ **LDAP User Name with Context:** Specify a typeful, distinguished name and context for an LDAP user. This user should be an eDirectory user that can access the DHCP server.	cn=joe,o=example
	◆ **LDAP User Password:** Type a password for the LDAP user.	
	◆ **LDAP Port for DHCP Server:** Select a port for the LDAP operations to use.	636

Page	Parameter	Default or Previously Entered Values
	◆ **Use Secure LDAP Channel:** This option is selected by default to ensure that the data transferred between the DHCP server and the LDAP server is secure and private. If you deselect this option, the data transferred is in clear text format.	Selected
	◆ **Certificates (optional)** ◆ **Request Certificate:** Specifies what checks to perform on server certificate in a SSL/TLS session. Select one of the following options: ◆ *Never*: The server does not ask the client for a certificate. This is the default ◆ *Allow*: The server requests a client certificate, but if a certificate is not provided or a wrong certificate is provided, the session still proceeds normally. ◆ *Try:* The server requests the certificate. If none is provided, the session proceeds normally. If a certificate is provided and it cannot be verified, the session is immediately terminated ◆ *Hard:* The server requests a certificate. A valid certificate must be provided, or the session is immediately terminated. ◆ **Paths to Certificate Files:** Specify or browse the path for the certificate files. ◆ The LDAP CA file contains CA Certificates ◆ The LDAP client certificate contains the client certificate. ◆ The LDAP client key file contains the key file for the client certificate.	
Novell DHCP Services Interface Selection		
	◆ **Network Boards for the Novell DHCP Server:** From the available interfaces, select the network interfaces that the Novell DHCP server should listen to.	

For additional configuration instructions, see "Installing and Configuring DHCP " in the *OES 2 SP2: Novell DNS/DHCP Administration Guide for Linux*.

3.6.8 Novell DNS Services

Table 3-12 *Novell DNS Services Parameters and Values*

Page	Parameter	Default or Previously Entered Values
Novell DNS Configuration		

Page	Parameter	Default or Previously Entered Values

	• **Common DNS configuration Object and User Contexts**
	  • **Get Context and Proxy User Information from Existing DNS Server:** Select this option if you are configuring DNS in an existing tree where DNS is already configured, and you want to use the existing Locator, Root Server Info, Group and Proxy User contexts.
	  • **Existing Novell DNS Server Address:** Type the IP of an NCP server that is hosting the existing DNS server and click *Retrieve*.
	  This will fetch the contexts of the Locator, Root Server Info, Group and Proxy User contexts. Make sure the NCP server hosting the existing DNS server is running before clicking *Retrieve*.
	  If you do not wish to use existing contexts, you can change those manually.
	  • **Directory server address:** Accept the default or select a different LDAP server in the list.
	  If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you need to add another LDAP server to the list, add it by using the LDAP Configuration for Open Enterprise Services dialog.
	  • **Novell DNS Services Locator Object Context:**
	  Specify the context for the DNS Locator object.
	  The Locator object contains global defaults, DHCP options, and a list of all DNS and DHCP servers, subnets, and zones in the tree.
	  • **Novell DNS Services Root Server Info Context:**
	  Specify the context for the DNS Services root server.
	  The RootSrvrInfo Zone is an eDirectory container object that contains resource records for the DNS root servers.
	  • **Novell DNS Services Group Object Context:**
	  Specify the context for the DNS Group object.
	  This object is used to grant DNS servers the necessary rights to other data within the eDirectory tree.
	  • **Proxy User for DNS Management:** Specify the FDN of the DNS proxy user.
	  An existing user must have eDirectory read, write, and browse rights under the specified context. If the user doesn't exist, itis created in the context specified.
	  • **Specify Password for eDirectory User:** Type the password for the DNS proxy user.
	  For more information on proxy user and password management, see "Planning Your Proxy Users" in the *OES 2 SP2: Planning and Implementation Guide*.
		The default is the first server selected in the *LDAP Configuration* list of servers.

Page	Parameter	Default or Previously Entered Values
	◆ **Local NCP Server Context:** Specify a context for the local NCP Server object.	o=example
	◆ **Use Secure LDAP Port:** This option is selected by default to ensure that the data transferred by this service is secure and private. If you deselect this option, the transferred data is in clear text format.	Selected
	◆ **Credential Storage Location:** Specify where the DNS proxy user's credentials are to be stored. For security reasons, the default and recommended method of credential storage is CASA.	CASA

For additional configuration instructions, see "Installing and Configuring DNS " in the *OES 2 SP2: Novell DNS/DHCP Administration Guide for Linux*.

3.6.9 Novell Domain Services for Windows

There are multiple configuration scenarios, depending on your deployment. For information, see "Installing Domain Services for Windows" in the *OES 2 SP2: Domain Services for Windows Administration Guide*.

3.6.10 Novell eDirectory Services

Table 3-13 *Novell eDirectory Parameters and Values*

Page	Parameter	Default or Previously Entered Values
eDirectory Configuration - New or Existing Tree		
	◆ **New or Existing Tree**	Selected
	◆ **New Tree:** Creates a new tree. Use this option if this is the first server to go into the tree or if this server requires a separate tree. Keep in mind that this server will have the master replica for the new tree, and that users must log into this new tree to access its resources.	
	◆ **Existing Tree:** Incorporates this server into an existing eDirectory tree. This server might not have a replica copied to it, depending on the tree configuration. For details, see the "Guidelines for Replicating Your Tree" in the *Novell eDirectory 8.8 Administration Guide*.	

Page	Parameter	Default or Previously Entered Values
	◆ **eDirectory Tree Name:** Specify a unique name for the eDirectory tree you want to create or the name of the tree you want to install this server into. ◆ **Use eDirectory Certificates for HTTPS Services:** Selecting this option causes eDirectory to automatically back up the currently installed certificate and key files and replace them with files created by the eDirectory Organizational CA (or Tree CA). Most OES services that provide HTTPS connectivity are configured by default to use the self-signed common server certificate created by YaST. Self-signed certificates provide minimal security and limited trust, so you should consider using eDirectory certificates instead. For all server installations, this option is enabled by default and is recommended for the increased security it provides. To prevent third-pary CA certificates from being accidentally backed up and overwritten, deselect this option. For more information on certificate management and this option, see "Security" in the *OES 2 SP2: Planning and Implementation Guide*. ◆ **Require TLS for Simple Binds with Password:** Select this option to make connections encrypted in the Session layer. ◆ **Install SecretStore:** Select this option to install SecretStore(SS), an eDirectory based security product.	
eDirectory Configuration - New/Existing Tree Information		
	◆ **IP Address of an Existing eDirectory Server with a Replica:** Type the IP address of a server with an eDirectory replica. This option only appears if you are joining an existing tree.	
	◆ **NCP Port on the Existing Server:** Type the NCP port used by the eDirectory server you specified. This option only appears if you are joining an existing tree.	524
	◆ **LDAP and Secure LDAP Ports on the Existing Server:** Type the LDAP ports used by the eDirectory server you specified. This option only appears if you are joining an existing tree.	389 636
	◆ **FDN Admin Name with Context:** Specify the name of the administrative user for the new tree. This is the fully distinguished name of a User object that will be created with full administrative rights in the new directory.	cn=admin,o=example

Page	Parameter	Default or Previously Entered Values
	◆ **Admin Password:** Specify the eDirectory administrator's password. This is the password of the user specified in the prior field.	
	◆ **Verify Admin Password:** Retype the password to verify it. This option only appears if creating a new tree.	
eDirectory Configuration - Local Server Configuration		
	◆ **Enter Server Context:** Specify the location of the new server object in the eDirectory tree.	
	◆ **Enter Directory Information Base (DIB) Location:** Specify a location for the eDirectory database. The default path is `/var/opt/novell/eDirectory/data/dib`, but you can use this option to change the location if you expect the number of objects in your tree to be large and the current file system does not have sufficient space.	`/var/opt/novell/eDirectory/data/dib`
	◆ **Enter LDAP Port:** Specify the LDAP port number this server will use to service LDAP requests.	389
	◆ **Enter Secure LDAP Port:** Specify secure LDAP port number this server will use to service LDAP requests.	636
	◆ **Enter iMonitor Port:** Specify the port this server will use to provide access to the iMonitor application. iMonitor lets you monitor and diagnose all servers in your eDirectory tree from any location on your network where a Web browser is available.	8028
	◆ **Enter Secure iMonitor Port:** Specify the secure port this server will use to provide access to the iMonitor application.	8030
eDirectory Configuration - NTP and SLP		

Page	Parameter	Default or Previously Entered Values
	◆ **Network Time Protocol (NTP) Server:** Specify the IP address or DNS hostname of an NTP server. ◆ For the first server in a tree, we recommend specifying a reliable, external time source. ◆ For servers joining a tree, specify the same external NTP time source that the tree is using, or specify the IP address of a configured time source in the tree. A time source in the tree should be running time services for 15 minutes or more before connecting to it, or the time synchronization request for the installation fails. If the time source server is NetWare 5.0 or earlier, you must specify an alternate NTP time source, or the time synchronization request fails. For more information, see "Time Services" in the *OES 2 SP2: Planning and Implementation Guide*. ◆ **Use Local Clock:** Alternatively, you can select *Use Local Clock* thus designating the server's hardware clock as the time source for your eDirectory tree. This is not recommended if there is a reliable external time source available.	

Page	Parameter	Default or Previously Entered Values
	◆ **(SLP Options)** ◆ **Do Not Configure SLP:** This option is good for eDirectory trees with three or fewer eDirectory servers. Without SLP, users can't see a tree list, but they should still be able to attach to a tree by name. Users can configure the Novell Client™ to use DNS, or they can configure the local host file (`%SystemDrive%\windows\system32\drivers\etc\hosts` on WinXP) to resolve tree and server names. Users can also specify preferred tree and context information in the DHCP Settings page of the Novell Client. **IMPORTANT:** If the tree where you are installing this server has or will have more than three servers, you must configure SLP. ◆ **Use Multicast to Access SLP:** This option allows the server to request SLP information by using multicast packets. Use this in environments that have not established SLP DAs (Directory Agents). **IMPORTANT:** If you select this option, you must disable the firewall for it to work correctly. Multicast creates a significant amount of network traffic and can reduce network throughput. ◆ **Configure as Directory Agent:** This option configures this server as a Directory Agent (DA). This is useful if you plan to have more than three servers in the tree and want to set up SLP during the installation. ◆ **Configure SLP to use an existing Directory Agent:** This option configures SLP to use an existing Directory Agent (DA) in your network. Use this in environments that have established SLP DAs. When selecting this option, you configure the servers to use by adding or removing them from the SLP Directory Agent list.	
	◆ **Service Location Protocols and Scope:** This option configures the scopes that a user agent (UA) or service agent (SA) is allowed when making requests or when registering services, or specifies the scopes a directory agent (DA) must support. The default value is DEFAULT. Use commas to separate each scope. For example, net.slp.useScopes = myScope1,myScope2,myScope3.	Default This information is required when selecting the *Use Multicast to Access SLP* or *Configure SLP to Use an Existing Directory Agent* option is selected.
	◆ **Configured SLP Directory Agents:** This option lets you manage the list of hostname or IP addresses of one or more external servers on which a SLP Directory Agent is running.	Enabled only when configuring SLP to use an existing Directory Agent.
Novell Modular Authentication Services		

Page	Parameter	Default or Previously Entered Values
	IMPORTANT: NMAS™ client software (included with Novell Client™ software) must be installed on each client workstation where you want to use the NMAS login methods. ◆ **CertMutual:** The Certificate Mutual login method implements the Simple Authentication and Security Layer (SASL) EXTERNAL mechanism, which uses SSL certificates to provide client authentication to eDirectory through LDAP. ◆ **Challenge Response:** The Challenge-Response login method works with the Identity Manager password self-service process. This method allows either an administrator or a user to define a password challenge question and a response, which are saved in the password policy. Then, when users forget their passwords, they can reset their own passwords by providing the correct response to the challenge question. ◆ **DIGEST-MD5:** The Digest MD5 login method implements the Simple Authentication and Security Layer (SASL) DIGEST-MD5 mechanism as a means of authenticating the user to eDirectory through LDAP. ◆ **NDS:** The NDS login method provides secure password challenge-response user authentication to eDirectory. This method supports the traditional NDS password when the NMAS client is in use. Reinstallation is necessary only if the NDS login method object has been removed from the directory. ◆ **Simple Password:** The Simple Password NMAS login method provides password authentication to eDirectory. The Simple Password is a more flexible but less secure alternative to the NDS password. Simple Passwords are stored in a secret store on the user object. ◆ **SASL GSSAPI** The SASL GSSAPI login method implements the Generic Security Services Application Program Interface (GSSAPI) authentication by using the Simple Authentication and Security Layer (SASL) that enables users to authenticate to eDirectory through LDAP by using a Kerberos™ ticket. If you want to install all of the login methods into eDirectory, click *Select All*. If you want to clear all selections, click *Deselect All*. For more information on these login methods, see "Managing Login and Post-Login Methods and Sequences" in the *Novell Modular Authentication Services 3.3.1 Administration Guide*.	Challenge Response and NDS selected

For additional configuration instructions, see "Installing or Upgrading Novell eDirectory on Linux" in the *Novell eDirectory 8.8 Installation Guide*.

3.6.11 Novell FTP Services

No additional configuration is required.

3.6.12 Novell iFolder

When you configure iFolder as part of the OES install and configuration, you can specify only an EXT3 or ReiserFS volume location for the System Store Path, which is where you are storing iFolder data for all your users. You cannot create NSS volumes during the system install.

If you want to use an NSS volume to store iFolder data, you must reconfigure iFolder after the initial OES installation. To reconfigure, use Novell iManager to create an NSS volume, then go to *YaST > Open Enterprise Server > Install and Configure Open Enterprise Services* and select *iFolder 3.6* to enter new information. All previous configuration information is removed and replaced.

Table 3-14 *Novell iFolder 3.6 Parameters and Values*

Page Parameter	Default or Previously Entered Values
Novell iFolder System Configuration Options	
◆ **iFolder Component to Be Configured** ◆ **iFolder Server:** This option lets you configure the settings for the iFolder server that is the central repository for storing user iFolders and synchronizing files for enterprise users. ◆ **iFolder Web Admin:** This option lets you create and configure settings for the administrator user. The iFolder Admin user is the primary administrator of the iFolder Enterprise Server. The Web Admin server does not need to be configured on the iFolder Enterprise Server. Devoting a separate server to the Web Admin application improves the performance of the iFolder Enterprise Server by reducing the admin traffic. ◆ **iFolder Web Access:** This option lets you configure the Web Access server, which is an interface that lets users have remote access to iFolders on the enterprise server. The Web Access server lets users perform all the operations equivalent to those of the iFolder client through using a standard Web browser. The Web Access server does not need to be configured in the same iFolder Enterprise Server. Directing the user tasks to a separate server and thereby reducing the HTTP requests helps to improve the performance of the iFolder Enterprise Server.	All three options are selected
Novell iFolder System Configuration	
◆ **Name Used to Identify the iFolder System to Users:** Specify a unique name to identify your iFolder Enterprise Server.	iFolder

Page	Parameter	Default or Previously Entered Values
	◆ **System Description (optional):** Specify a descriptive label for your iFolder Enterprise Server to identify it to the users.	iFolder Enterprise System
	◆ **Path to Server's Data Files:** Specify the case-sensitive address of the location where the iFolder Enterprise Server stores iFolder application files as well as the user iFolders and files. **IMPORTANT:** This location cannot be modified after install.	`/var/simias/data/`
	◆ **Path to the Default Configuration Files:** Specify the case-sensitive address of the location where the iFolder Enterprise Server stores iFolder configuration files. **IMPORTANT:** This location cannot be modified after install, and it can be the same location as that of the server data files.	`/var/simias/conf`
	◆ **Path to the Recovery Agent Certificates (optional):** Specify the path to the recovery agent certificates that are used for recovering the encryption key.	
Novell iFolder System Configuration (2)		
	◆ **Name of iFolder Server:** Specify a unique name to identify your iFolder Enterprise Server. For example: Host1.	*server_name*
	◆ **iFolder Public URL:** Specify the public URL for users to reach the iFolder Enterprise Server.	*local ip address*
	◆ **iFolder Private URL:** Specify the private URL corresponding to the iFolder Enterprise Server to allow communication between the servers within the iFolder domain. The private URL and the public URL can be the same.	*local ip address*

Page	Parameter	Default or Previously Entered Values
	◆ **Select SSL Option for iFolder:** Select the SSL option you want to set up a secure connection between the iFolder server and the iFolder clients. There are three options for the channel for data transfer: SSL, Non SSL, and Both. However, authentication is always over SSL (not optional). ◆ *Both:* (default) This option lets you select secure or non secure channel for communication among the iFolder server, Web Admin server, Web Access server and the clients. ◆ *Non SSL:* Select this option to enable unsecured communication between the iFolder server, Web Admin server, Web Access server and the clients. The iFolder uses the HTTP channel for communication. ◆ *SSL:* Select this option to enable a secure connection among the iFolder server, iFolder Web Admin server, iFolder Web Access server, and the iFolder clients. The iFolder uses the HTTPS channel for communication. By default, these components use the HTTPS (secure)communication channel. However, all components can also be configured to use HTTP.	
	◆ **iFolder Port to Listen On:** Specify the port for the iFolder to listen on.	80
	◆ **Install into Existing iFolder Domai:n** Select this option when you want to attach to an existing iFolder domain. If this option is not selected, this server becomes the Master iFolder server.	not selected
	◆ **Private URL of the Master Server:** Specify the private URL of the Master iFolder server that holds the master iFolder data for synchronization to the current iFolder Enterprise Server.	
	◆ **Configure LDAP Groups Plugin:** Select this option to configure the LDAP Groups plug-in. If this option is left unselected, iFolder will not have LDAP Group support enabled.	
Novell iFolder LDAP Configuration		

Page	Parameter	Default or Previously Entered Values
	◆ **Directory server address:** The IP address shown is the default LDAP server for this service. If you do not want to use the default, select a different LDAP server in the list. If you need to add another eDirectory LDAP server to the list, use the LDAP Configuration for Open Enterprise Services dialog. If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you are installing into an existing tree, you must enter the password of an admin user in the tree.	The default is the first server selected in the *LDAP Configuration* list of servers.
	◆ **Use Alternate LDAP server:** If you need to add another LDAP server to the list, select this option and enter the following information: ◆ **Alternate Directory Server Address:** Specify the host or IP address of the alternate LDAP server that iFolder will use. ◆ **LDAP Port:** Specify the LDAP port to use for this alternate server. ◆ **LDAP Secure Port:** Specify the LDAP secure port to use for this alternate server. ◆ **Admin Name and Context:** Specify the administrator name and context for the alternate LDAP server. ◆ **Admin Password:** Type the specified administrator's password.	
Novell iFolder System Configuration		
	◆ **The iFolder Default Administrator:** Specify the username for the default iFolder administrative user. Use the full distinguished name of the iFolder administrative user.	cn=admin,o=example
	◆ **iFolder Admin Password:** Specify a password for the iFolder administrative user.	
	◆ **Verify iFolder Admin Password:** Type the password for the iFolder administrative user again.	
	◆ **LDAP Proxy User:** Specify the full distinguished name of the LDAP Proxy user. This user must have the Read right to the LDAP service. This user is used to provision the users between iFolder Enterprise Server and the LDAP server. If it does not already exist, this user is created and granted the Read right to the root of the tree. The LDAP proxy user's domain name (DN) and password are stored by iFolder.	cn=user,o=example

Page	Parameter	Default or Previously Entered Values
	◆ **LDAP Proxy User Password:** Specify a password for the LDAP Proxy user. For more information on proxy user and password management, see "Planning Your Proxy Users" in the *OES 2 SP2: Planning and Implementation Guide*.	
	◆ **Verify LDAP Proxy User Password:** Type the password for the LDAP Proxy user again.	
	◆ **LDAP Search Context:** Click *Add*, then specify an LDAP tree context to be searched for users to provision them in iFolder. For example, o=acme, o=acme2, or o=acme3 If no context is specified, only the iFolder administrative user is provisioned for services during the install.	o=example
	◆ **LDAP Naming Attribute:** Select which LDAP attribute of the User account to apply when authenticating users. This setting cannot be changed after the install. Each user enters a username in this specified format at login time. Common Name (CN) is the default, and an e-mail address (email) is the other option. For example, if a user named John Smith has a common name of jsmith and e-mail of john.smith@example.com, this field determines whether the user enters jsmith or john.smith@example.com as the username when logging in to the iFolder Enterprise Server.	Common Name (CN)
	◆ **Require a Secure Connection Between the LDAP server and the iFolder Server.:** If the LDAP server co-exists on the same computer as the iFolder Enterprise Server, you can deselect this option, which increases the performance of LDAP authentications.	Selected
Novell iFolder Web Access Configuration		
	◆ **Apache Alias:** Specify the Apache alias to point to the iFolder Web Access Application. This is a user-friendly pointer for the Apache service.	/ifolder
	◆ **Host or IP Address of the iFolder Server:** Specify the host or IP address of the iFolder Enterprise Server to be used by the iFolder Web Access application. This Web Access application performs all the user-specific iFolder operations on the host that runs the iFolder Enterprise Server.	*local server*
	◆ **Redirect URL for iChain/Access Gateway (optional):** Specify the redirect URL for iChain/AccessGateway that will be used by the iFolder Web Access application. This URL is used for the proper logout of iChain/ AccessGateway sessions along with the iFolder session.	

Page	Parameter	Default or Previously Entered Values
	◆ **Connect to the iFolder Server Using SSL:** Select the check box to establish a secure connection between the iFolder enterprise server and the iFolder Web Admin application.	
	◆ **iFolder Server Port to Connect on:** Specify the port for the iFolder server to connect to the Web Acess application. Port 443 is the default. Port 80 is the default value for non-SSL communication.	
	◆ **Require a secure connection between the Web browser and the iFolder Web Access application** Select the check box to establish a secure connection between the Web browser and the iFolder Web Access application.	
Novell iFolder Web Admin Configuration		
	◆ **Apache Alias:** Specify an Apache alias to point to the iFolder Web Admin application. This is an admin-friendly pointer for the Apache service.	/admin
	◆ **Host or IP Address of the iFolder Server:** Specify the hostname or IP address of the iFolder Enterprise Server to be managed by the iFolder Web Admin application. The iFolder Web admin application manages this host.	*local server*
	◆ **Redirect URL for iChain/Access Gateway (optional):** Specify the redirect URL for iChain/AccessGateway that will be used by the iFolder Web Admin application. This URL is used for the proper logout of iChain/ AccessGateway sessions along with the iFolder session.	
	◆ **Connect to the iFolder Server Using SSL:** Select the check box to establish a secure connection between the iFolder enterprise server and the iFolder Web Admin application.	
	◆ **iFolder Server Port to Connect on:** Specify the port for the iFolder server to connect to the Web Admin application. Port 443 is the default. Port 80 is the default value for non-SSL communication.	
	◆ **Require a secure connection between the Web browser and the iFolder Web Access application** Select the check box to establish a secure connection between the Web browser and the iFolder Web Admin application.	

For additional configuration instructions, see "Installing and Configuring iFolder Services" in the *Novell iFolder 3.8 Administration Guide*.

3.6.13 Novell iManager

Table 3-15 *Novell iManager Parameters and Values*

Page	Parameter	Default or Previously Entered Values
iManager Configuration		
	◆ **eDirectory Tree:** Shows the name of a valid eDirectory tree that you specified when configuring eDirectory. To change this configuration, you must change the eDirectory configuration.	exampletree
	◆ **FDN Admin Name with Contextt:** Shows the eDirectory Admin name and context that you specified when configuring eDirectory. This is the user that has full administrative rights to perform operations in iManager.	cn=admin,o=example

For additional configuration instructions, see "Installing iManager" in the *Novell iManager 2.7 Installation Guide*.

3.6.14 Novell iPrint

Table 3-16 *Novell iPrint Parameters and Values*

Page	Parameter	Default or Previously Entered Values
iPrint Configuration		

Page	Parameter	Default or Previously Entered Values
	◆ **Directory server address:** The IP address shown is the default LDAP server for this service. If you do not want to use the default, select a different LDAP server in the list. If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you need to add another LDAP server to the list, add it by using the LDAP Configuration for Open Enterprise Services dialog. ◆ **Top-Most Container of eDirectory Tree:** iPrint uses LDAP to verify rights to perform various iPrint operations, including authenticating users for printing and performing management tasks such as uploading drivers. During the installation of the iPrint software, iPrint attempts to identify the top-most container of the eDirectory tree and sets the base dn to this container for the AuthLDAPURL entry in /etc/opt/novell/iprint/httpd/conf/iprint_ssl.conf. For most installations, this is adequate because users are often distributed across containers. **IMPORTANT:** If you have mutliple peer containers at the top of your eDirectory tree, leave this field blank so that the LDAP search begins at the root of the tree.	The default is the first server selected in the *LDAP Configuration* list of servers.

For additional configuration instructions, see "Installing and Setting Up iPrint on Your Server" in the *OES 2 SP2: iPrint for Linux Administration Guide*.

3.6.15 Novell Linux User Management

Table 3-17 *Novell Linux User Management Parameters and Values*

Page	Parameter	Default or Previously Entered Values
	◆ **Directory Server Address:** The IP address shown is the default LDAP server for this service. If you do not want to use the default, select a different LDAP server in the list. If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you need to add another LDAP server to the list, add it by using the LDAP Configuration for Open Enterprise Services dialog. <Defect 332088 requests information on configuring multiple LDAP servers, a primary and alternates. This is being added to the LUM documentation and should be linked here when completed.>	The default is the first server selected in the *LDAP Configuration* list of servers.

Page	Parameter	Default or Previously Entered Values
	◆ **Unix Config Context:** The Unix Config object holds a list of the locations (contexts) of Unix Workstation objects in eDirectory. It also controls the range of numbers to be assigned as UIDs and GIDs when User objects and Group objects are created. Specify the eDirectory context (existing or created here) where the Unix Config object will be created. An LDAP search for a LUM User, a LUM Group, or a LUM Workstation object begins here, so the context must be at the same level or higher than the LUM objects searched for. If the Unix Config Object is placed below the location of the User objects, the `/etc/nam.conf` file on the target computer must include the support-outside-base-context=yes parameter. Geographically dispersed networks might require multiple Unix Config objects in a single tree, but most networks need only one Unix Config object in eDirectory.	o=example
	◆ **Unix Workstation Context:** Computers running Linux User Management (LUM) are represented by Unix Workstation objects in eDirectory. The object holds the set of properties and information associated with the target computer, such as the target workstation name or a list of eDirectory groups that have access to the target workstation. Specify the eDirectory context (existing or created here) for the Unix Workstation object created by the install for this server. The context should be the same as or below the Unix Config Context specified above.	o=example
	◆ **Proxy User Name with Context (Optional):** Specify a user (existing or created here) with rights to search the LDAP tree for LUM objects.	cn=proxy,o=novell
	◆ **Proxy User Password:** Specify a password (existing or created here) for the Proxy user. For more information on proxy user and password management, see "Planning Your Proxy Users" in the *OES 2 SP2: Planning and Implementation Guide*.	
	◆ **Restrict Access to the Home Directories of Other Users:** This option is selected by default to restrict read and write access for users other than the owner to home directories. Using the default selection changes the umask setting in `/etc/login.defs` from 022 to 077.	Selected

Page	Parameter	Default or Previously Entered Values
	◆ **Services to LUM-enable for authentication via eDirectory:** Select the services to LUM-enable on this server. The services marked *yes* be available to authenticated LUM users. ◆ *login*: no ◆ *ftp*: no ◆ *sshd*: no If you want to use the SSH protocol to define a NetStorage storage location object, you must select SSHD as a LUM-enabled service. If do not select *SSHD*, users cannot to log in to NetStorage through SSH to access their files. ◆ *su*: no ◆ *rsh*: no ◆ *rlogin*: no ◆ *xdm*: no ◆ *openwbem*: yes This is selected by default because it is used by many of the OES services such as iPrint, NSS, SMS, Novell Remote Manager, and Samba. To get access to iManager, you must enable OpenWBEM. ◆ *gdm*: no ◆ *gdm-autologin*: no ◆ *gnome-passwd*: no ◆ *gnome-screensaver*: no ◆ *gnomesu-pam*: no	**IMPORTANT:** Before you change the PAM-enabled service settings, be sure you understand the security implications explained in "User Restrictions: Some OES 2 Linux Limitations" in the *OES 2 SP2: Planning and Implementation Guide*.

For additional configuration instructions, see "Setting Up Linux User Management" in the *OES 2 SP2: Novell Linux User Management Technology Guide*.

3.6.16 Novell NCP Server / Dynamic Storage Technology

Table 3-18 *Novell NCP Server Parameters and Values*

Page	Parameter	Default or Previously Entered Values
NCP Server Configuration		
	◆ **Admin Name with Context:** This value is a default value that is specified in the eDirectory configuration.	cn=admin,o=example

For additional configuration instructions, see "Installing and Configuring NCP Server for Linux" in the *OES 2 SP2: NCP Server for Linux Administration Guide*.

3.6.17 Novell NetStorage

Table 3-19 *Novell NetStorage Parameters and Values*

Page Parameter	Default or Previously Entered Values
NetStorage Configuration	
◆ **Authentication Domain Host:** The IP address shown is the default LDAP server for this service. If you do not want to use the default, select a different LDAP server in the list. If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you need to add another LDAP server to the list, add it by using the LDAP Configuration for Open Enterprise Services dialog.	The default is the first server selected in the *LDAP Configuration* list of servers.
◆ **Proxy User Name with Context:** Enter the Proxy User Name including the context, or accept the default. This user performs LDAP searches for users logging into NetStorage.	cn=admin,o=example
◆ **Proxy User Password:** Enter a password for the proxy user. For more information on proxy user and password management, see "Planning Your Proxy Users" in the *OES 2 SP2: Planning and Implementation Guide*.	o=example
◆ **User Context:** Enter the Users Context, or accept the default. This is the eDirectory context for the users that will use NetStorage. NetStorage searches the eDirectory tree down from the specified context for User objects. If you want NetStorage to search the entire eDirectory tree, specify the root context.	o=example

For additional configuration instructions, see "Installing NetStorage" in the *OES 2 SP2: NetStorage for Linux Administration Guide*.

3.6.18 Novell Pre-Migration Server

No additional configuration is required. For information, see "Preparing the Source Server for Migration" the *OES 2 SP2: Migration Tool Administration Guide*.

3.6.19 Novell QuickFinder

Table 3-20 *Novell QuickFinder Parameters and Values*

Page Parameter	Default or Previously Entered Values
Novell QuickFinder Admin User	
◆ **Novell QuickFinder Admin User Type:** Make the QuickFinder administrator a LUM-enabled eDirectory user or a local Linux user. ◆ *Local*: Select this option to give QuickFinder Server administration rights to a local Linux user (the default is the `root` user if no other local users exist). ◆ *Directory LUM Enabled*: Gives QuickFinder Server administration rights to an eDirectory user.	Local
◆ **eDirectory Admin Name:** Enter the QuickFinder administrator name. If you selected *Directory LUM enabled* as the user type, include the full context (such as cn=admin,o=novell). If you selected *Local* as the user type, enter only the admin name (such as root). If the user does not already exist, it will be created.	cn=admin.o=example
◆ **Add novlwww User to the Shadow Group:** If only LUM-enabled eDirectory users will use QuickFinder, this option does not need to be set. QuickFinder uses the Pluggable Authentication Modules (PAM) to authenticate users for both administration and rights-based searching. Because QuickFinder is a servlet under Tomcat, it has the same rights to the system as the Tomcat user (wwwrun). For QuickFinder to verify user credentials for local users (including root), the wwwrun user must be added to the local shadow group.	Selected

For additional configuration instructions, see "Installing QuickFinder Server" in the *OES 2: Novell QuickFinder Server 5.0 Administration Guide*.

3.6.20 Novell Remote Manager

No additional configuration for the installation is required. To change the configuration after the installation, see "Changing the Configuration" in the *OES 2 SP2: Novell Remote Manager for Linux Administration Guide*.

3.6.21 Novell Samba

Table 3-21 *Novell Samba Parameters and Values*

Page	Field or Selection	Default or Previously Entered Values and Comments
Novell Samba Configuration		
	◆ **Directory server address:** The IP address shown is the default LDAP server for this service. If you do not want to use the default, select a different LDAP server in the list. If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you need to add another LDAP server to the list, add it by using the LDAP Configuration for Open Enterprise Services dialog. This is the primary IP address of the LDAP server to which CIFS client users (such as Windows users) authenticate, to use LDAP for access to the directories and files on this OES server.	The default is the first server selected in the *LDAP Configuration* list of servers.
	◆ **Base Context for Samba Users:** The eDirectory context (existing or created here) where the default Samba group is created. By default, this is the same context as the LUM Workstation object. Do not change the default unless you are altering the standard Samba configuration.	o=example
	◆ **Proxy User Name with Context:** A user on the LDAP server specified that has rights to search the LDAP tree for Samba users. The name and context must be specified using typeful syntax. (cn=name,ou=organizational_unit,o=organization)	cn=*servername*-sambaProxy.o=example
	◆ **Proxy User Password:** The password of the Proxy User specified above. For more information on proxy user and password management, see "Planning Your Proxy Users" in the *OES 2 SP2: Planning and Implementation Guide*.	System-generated

For additional configuration instructions, see "Installing the Novell Samba Components" in the *OES2 SP2: Samba Administration Guide*.

3.6.22 Novell Storage Services (NSS)

Table 3-22 *Novell Storage Services Parameters and Values*

Page Parameter	Default or Previously Entered Values
NSS Unique Admin Object	
◆ **Directory Server Address:** The IP address shown is the default LDAP server for this service. If you do not want to use the default, select a different LDAP server in the list. If you are installing into an existing tree, ensure that the server you select has a master replica or read/write replica of eDirectory. If you need to add another LDAP server to the list, add it by using the LDAP Configuration for Open Enterprise Services dialog.	The default is the first server selected in the *LDAP Configuration* list of servers.
◆ **FD NSS Admin Name with Context:** Enter the NSS Admin name and context or accept the default. This is the fully distinguished name of a User object with administrative rights to NSS. You must have a unique NSS admin name for each server that uses NSS. The default NSS Admin Name is the server host name concatenated with the LDAP Admin Name you entered for this server. For example: cn=myserveradmin,o=acme	cn=*servername*admin.o=example

For additional configuration instructions, see "Installing and Configuring Novell Storage Services" in the *OES 2 SP2: NSS File System Administration Guide*.

3.7 What's Next

After you've completed the initial installation, complete any additional tasks you might need to perform. See "Completing OES Installation or Upgrade Tasks" on page 145 and "Updating (Patching) an OES 2 SP2 Server" on page 149.

Installing/Configuring OES 2 SP2 on an Existing Server

4

After installing or upgrading to Novell® Open Enterprise Server (OES 2 SP2), you can also install additional products or services and configure them to work in the new environment. If you have installed or upgraded a server to SUSE® Linux Enterprise Server (SLES) 10 SP3, you can also add OES 2 SP2 services to the server.

IMPORTANT: If you have updated a server with a Support Pack, make sure the installation source is pointing to the latest Support Pack media.

4.1 Before You Install OES Services on an Existing Server

4.1.1 Always Use YaST to Install and Initially Configure OES

Linux administrators sometimes wrongly assume that OES services can be installed or uninstalled by simply installing the associated RPMs. OES services require additional configuration that are only supported in YaST.

4.1.2 Don’t Install OES While Running the Xen Kernel

If you are adding supported OES2 components to a server that is running the Xen kernel, you must reset the boot loader to boot the standard kernel before adding the OES 2 SP2 components.

1. In YaST, select *System* > *Boot Loader* > *SuSE Linux Enterprise Server 10 SP3* > *Set As Default* > *Finish*.
2. Reboot the server.

After adding the supported OES2 components, reset the boot loader option to Xen.

1. In YaST, select *System* > *Boot Loader* > *XEN* > *Set As Default* > *Finish*.
2. Reboot the server.

Be sure to add only those OES 2 SP2 components that are supported on a VM host server. For more information, see “Step 3 on page 177”.

4.2 Installing or Configuring OES Services on an Existing Server

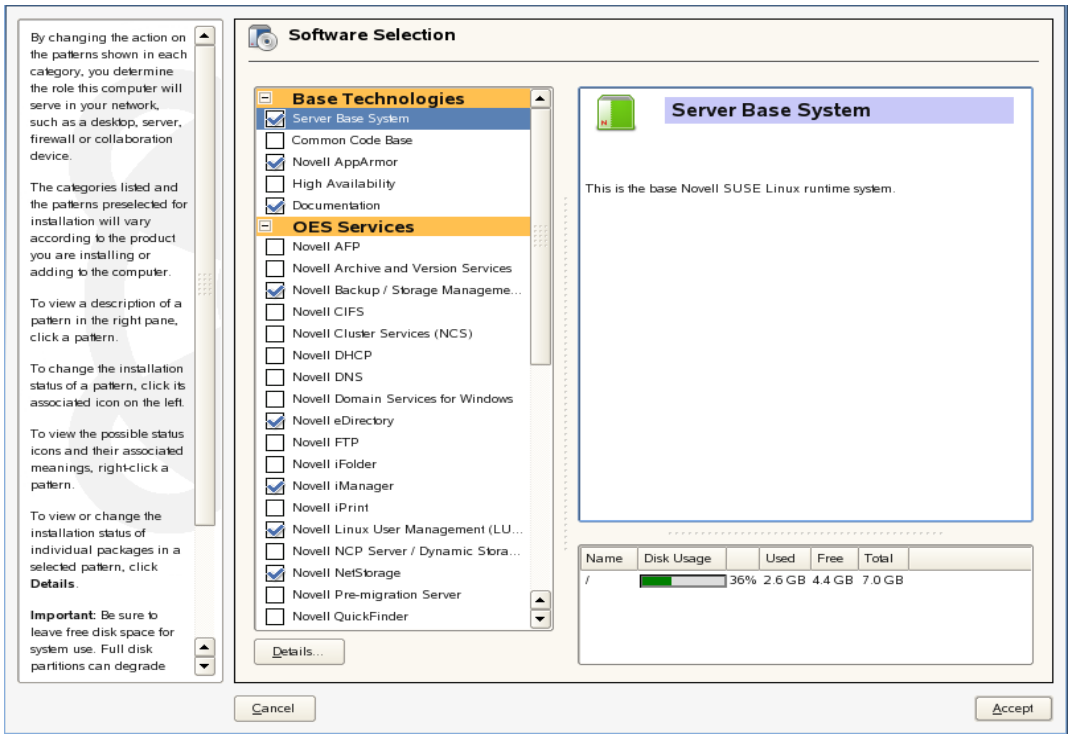
NOTE: For information on installing and/or configuring OES services as a different administrator than originally installed the OES server, see Section 2.5, "Installing OES As a Subcontainer Administrator," on page 19.

To install or configure OES 2 SP2 services on an existing OES 2 SP2 server or SLES 10 SP3 server:

1. Open YaST.
2. If an OES 2 SP2 installation source has not been added to the server, continue with this step. Otherwise, skip to Step 3.
   - **2a** Click *Software* > *Add-on Product*.
   - **2b** Click *Add*.
   - **2c** In the Add-On Product Media dialog, click *CD* > *Next*.

     If you are using an alternate installation source, click the appropriate option that matches your installation source selection.
   - **2d** In the Insert the Add-On Product CD dialog, select the appropriate drive where you want to insert the CD labeled *Open Enterprise Server 2 SP2 CD 1*.
   - **2e** Click *Eject*.
   - **2f** Insert the CD labeled *Open Enterprise Server 2 SP2 CD 1*, then click *Continue*.
   - **2g** Read and accept the Novell Open Enterprise Server 2 license agreement, then click *Next*.
   - **2h** Confirm that the Add-On Product Installation page shows the correct path to the OES media, then click *Next*.
   - **2i** Skip to Step 4.
3. If an OES installation source has already been added to the server, click *Open Enterprise Server* > *OES Install and Configuration*.
4. On the Software Selection page, select the OES components that you want to install or configure.

   Services that you have already installed are indicated by a blue check mark in the status check box next to the service.
5. If you are only configuring or reconfiguring services that are already installed, click *Accept*, then skip to Step 7.



Not all OES components require eDirectory to be installed on the local server. Components that have a dependency on eDirectory being installed locally will prompt you to install eDirectory if it is not already installed.

IMPORTANT: If you want the OES components to use a local eDirectory database, we recommend that you install eDirectory before installing any other OES component.

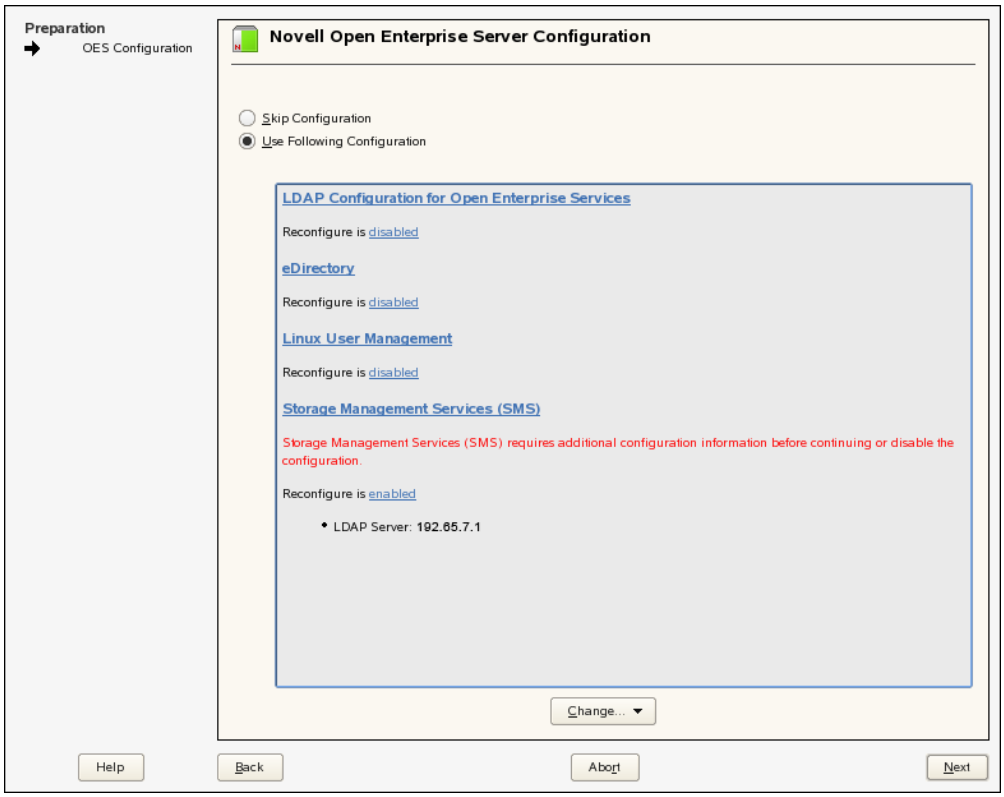
If you need to reconfigure eDirectory, we recommend that you use tools provided by eDirectory such as iMonitor or iManager to change the configure rather than YaST. The configuration provided in YaST is for the initial eDirectory installation and configuration only.

---

6 After selecting the services to install, click *Accept*.

7 Change the default configuration information as required.

Figure 4-1 *Example of the OES Configuration Dialog with Configuration and Re-Configuration Statuses*



In most cases, the default configuration is acceptable. You need to change the configuration at the following times:

- When the installation indicates that more information is required by displaying the following message:

  service_name `service requires additional configuration information before continuing or disable the configuration.`

- You want to change the default configuration settings, such as enabling services for LUM.
- You want to reconfigure a service that has already been configured.

7a To change the configuration of a newly installed service or a service that has already been configured, change its configuration status to *Enabled*, then click the service heading link to access the configuration dialog for that service.

Newly installed services that have not been configured have the status of `Configure is enabled`.

Services that have already been configured have a status of `Reconfigure is disabled`.

7b To enable the configuration status of any disabled service configuration, click the *Disabled* link to change the status to *Enabled*.

7c To delay the configuration of newly installed services to a later time, click the *Enabled* link to change the status to `Configure is disabled`.

8 When all the services have complete configuration information and the configuration or reconfiguration status is set to enable for the services that you want to configure, click *Next* to continue with the configuration process.

4.3 What's Next

After you've completed the configuration process, complete any additional tasks you might need to perform. See “Completing OES Installation or Upgrade Tasks” on page 145 and “Updating (Patching) an OES 2 SP2 Server” on page 149.

5 Upgrading to OES 2 SP2

Novell® Open Enterprise Server 2 provides the option of updating an existing system to the new version without completely reinstalling it. No new installation is needed. Existing data such as home directories and system configuration is kept intact. During the life cycle of the product, you can apply Service Packs to increase system security and correct software defects.

NOTE: To upgrade an OES 2 VM guest running on Xen, see the additional instructions and information in Section 10.5, "Upgrading an OES 2 VM Guest to OES 2 SP2," on page 186.

5.1 Supported Upgrade Paths

Table 5-1 outlines the supported paths for upgrading to OES 2 SP2.

Table 5-1 *Supported OES 2 SP2 Upgrade Paths*

Source	Destination	Upgrade Methods Suppported
OES 1 SP2 (32-bit)	OES 2 SP2 (32-bit)	Network-based media (offline) Physical media (offline)
OES 2 (32-bit)	OES 2 SP2 (32-bit)	Network-based media (offline) Physical media (offline)
OES 2 (64-bit)	OES 2 SP2 (64-bit)	Network-based media (offline) Physical media (offline)
OES 2 SP1 (32-bit)	OES 2 SP2 (32-bit)	Network-based media (offline) Physical media (offline) Update Channel (online)
OES 2 SP1 (64-bit)	OES 2 SP2 (64-bit)	Network-based media (offline) Physical media (offline) Update Channel (online)

IMPORTANT: Source servers must have all patches applied from the appropriate SLES and OES patch channels prior to an upgrade.

5.2 Planning for the Upgrade to OES 2 SP2

5.2.1 Be Sure to Check the Readme

The "Installation Issues" section documents issues that Novell plans to address in a future release.

5.2.2 Always Upgrade SLES and OES at the same time

You must upgrade SUSE® Linux Enterprise Server (SLES) 10 and OES 2 at the same time.

5.2.3 Understanding the Implications for Other Products Currently Installed on the Server

OES 1 Server Upgrades: Non-OES 2 Packages Are Deleted by Default:

During the upgrade process from OES 1 to OES 2 SP2, packages that are not part of the SLES 10 and OES 2 distributions are automatically selected for deletion.

Examples include:

- **OES 1 services not included in OES 2:** Such as iFolder 2, eGuide, and Virtual Office. For more information, see "eGuide, IFolder 2, and Virtual Office Are Still Available on Netware" in the *OES 2 SP2: Planning and Implementation Guide*.
- **Other Novell products:** Such as GroupWise®, ZENworks®, and Identity Manager.

For Information About This Novell Product	See This Documentation
GroupWise	GroupWise 7 online documentation (http://www.novell.com/documentation/groupwise.html)
ZENworks	ZENworks online documentation (http://www.novell.com/documentation/zenworks.html)
Identity Manager	Identity Management online documentation (http://www.novell.com/documentation/secure_identity_management.html)
All other	All Novell online documentation (http://www.novell.com/documentation/)

- **SLES 9 services not included in SLES 10:** If you installed open source products that were included with the SLES 9 distribution, it is possible although unlikely that they have been removed in SLES 10.
- **Third-party products:** If you have installed third-party products, be sure to check that it is supported on SLES 10 and follow the upgrade instructions that should be included with it.

To manually retain packages, you must follow the steps outlined in Section 5.4.9, "Reviewing the Delete Unmaintained Packages Notification," on page 128.

IMPORTANT: There is no guarantee that packages you have manually retained will run on the SLES 10 kernel. For specific compatibility information, see the documentation for the impacted product.

OES 2 Server Upgrades: Non-OES 2 Packages Are Retained but Might Not Work After Upgrading:

During the upgrade process from OES 2 to OES 2 SP2, packages that are not part of the SLES 10 SP3 and OES 2 SP2 distributions are automatically retained unless you select them for deletion.

This includes third-party products you have installed as well as other Novell products, such as GroupWise®, ZENworks®, and Identity Manager.

There is no guarantee that these products will continue to work after you upgrade. Therefore, it is critical that you check the product documentation for compatibility information before you upgrade servers with any Novell product installed.

For Information About This Novell Product	See This Documentation
GroupWise	GroupWise 7 online documentation (http://www.novell.com/documentation/groupwise.html)
ZENworks	ZENworks online documentation (http://www.novell.com/documentation/zenworks.html)
Identity Manager	Identity Management online documentation (http://www.novell.com/documentation/secure_identity_management.html)
All other	All Novell online documentation (http://www.novell.com/documentation/)

If you have installed a third-party product, be sure to check that it is supported on SLES 10 SP3 and follow the upgrade instructions that should be included with it.

5.3 Meeting the Upgrade Requirements

Meet the following requirements before you upgrade and install any OES 2 components:

- Section 5.3.1, "Securing Current Data," on page 116
- Section 5.3.2, "Ensuring There Is Adequate Storage Space on the Root Partition," on page 116
- Section 5.3.3, "Preparing Your Target Server," on page 117
- Section 5.3.4, "Checking the Server's IP Address," on page 117

- Section 5.3.5, “Checking the Server’s DNS Name,” on page 117
- Section 5.3.6, “Making Sure the Server Has a Server Certificate,” on page 117
- Section 5.3.7, “Preparing an Installation Source,” on page 118

5.3.1 Securing Current Data

Before upgrading, secure the current data on the server. For example, make a backup copy of the data, so you can restore the data volumes later from a backup copy if needed.

Save your configuration files. Copy all configuration files to a separate medium, such as a streamer, removable hard disk, USB stick, or ZIP drive, to secure the data. This primarily applies to files stored in `/etc` as well as some of the directories and files in `/var` and `/opt`. You might also want to write the user data in `/home` (the HOME directories) to a backup medium. Back up this data as `root`. Only `root` has read permission for all local files.

5.3.2 Ensuring There Is Adequate Storage Space on the Root Partition

Before starting your upgrade, make note of the root partition and space available.

If you suspect you are running short of disk space, secure your data before updating, and repartition your system. There is no general rule of thumb regarding how much space each partition should have. Space requirements depend on your particular partitioning profile and the software selected.

WARNING: If your root partition resides in an EVMS container, you might not be able to repartition or expand the size of the root partition without destroying data elsewhere on the device.

The `df -h` command lists the device name of the root partition. In the following example, the root partition to write down is /dev/`hda3` (mounted as `/`).

Example: List with df -h.

```
ti:~ # df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/hdb2             186G  2.9G  183G   2% /
udev                  506M  204K  506M   1% /dev
ti:~ #
```

File System	Size	Used	Avail	Use%	Mounted on
/dev/hda3	74G	22 G	53 G	29%	
/tmpfs	506M	0	506M	0%	/dev/shm
/dev/hda5	116G	5.8G	111G	5%	/home
/dev/hda1	39G	1.6G	37G	4%	/window/C
/dev/hda2	4.6G	2.6G	2.1G		/window/D

5.3.3 Preparing Your Target Server

Complete the steps in Table 5-2 for your target server.

Table 5-2 *Preparing Your Target Server*

If Your Target Server Is Running	Do This Before Upgrading the Server
SLES 10 SP1	❑ Ensure that the products and services you have running on the server can run on the new SLES 10 SP3 kernel. ❑ Make sure the server meets the hardware requirements for SLES 10 SP3. See "System Requirements for Operating Linux" in the *Architecture-Specific Information Guide* (http://www.novell.com/documentation/sles10/sles_x86/data/cha_sysreqs.html). Itanium is not a supported platform for OES 2 SP2.
OES 1 or OES 1 SP1	1. Upgrade your server to OES 1 SP2 first. For assistance, see the OES 1 Documentation on the Web (http://www.novell.com/documentation/oes).
OES 1 SP2	1. Verify the OES 1 server version by using the following command at a terminal prompt: `cat /etc/novell-release` 2. Patch the OES 1 SP2 server to the latest patch level and ensure that the server and services are still running as desired. For procedures, see "Patching an OES Server" in the *OES 1 Linux Installation Guide*. (http://www.novell.com/documentation/oes/install_linux/data/bxlu3xc.html#bxlu3xc)
OES 2	1. Run *YaST* > *Software* > *Online Update* to patch the OES 2 server to the latest patch level. 2. Ensure that the server and services are still running as desired.

5.3.4 Checking the Server's IP Address

Make sure the server has a static IP address.

5.3.5 Checking the Server's DNS Name

Make sure that DNS returns the correct static IP address when you ping the server's full DNS name. For example

```
ping myserver.example.com
```

5.3.6 Making Sure the Server Has a Server Certificate

NOTE: Most OES servers have either an eDirectory or a third-party certificate installed. These instructions only apply when that is not the case.

Make sure the server has a server certificate that has been generated and exported as a Common Server certificate.

To check for or add a certificate, do the following:

1. Launch YaST.
2. Click *Security and Users* > *CA Management*.
3. If no certificate authorities (CAs) are listed, create one by clicking *Create Root CA*.

   If a CA is listed, you can use it by selecting the CA and clicking *Enter CA*.
4. If you are using a listed CA, you must provide the CA password (generally the root password).
5. Click *Certificates* > *Add*.
6. Fill out the forms required for a server certificate. After the last form is complete, a server certificate is created and listed in the certificate list.
7. Select the certificate you just created.
8. Click the *Export* button, then select *Export as Common Server Certificate*.

5.3.7 Preparing an Installation Source

Review and complete the instructions for "Setting Up an Installation Source" on page 39. We recommend using the network installation option, especially if you are upgrading multiple servers.

5.4 Upgrading to OES 2 SP2

Use the following instructions to complete the upgrade applicable to the installation source you are using:

5.4.1 For Servers with EVMS and NSS on the System Device

NOTE: This section doesn't apply if you are upgrading through the patch channel (Upgrading Using the Patch Channel (Online) (page 122).)

If you are upgrading a server that has EVMS as the volume manager for the system device (the device that contains the `/boot`, `swap`, and `/` (root) partitions), and might also have Novell Storage Services™ (NSS) pools and volumes on the system device, you need to enable boot.lvm and boot.md.

Do the following just before you begin the upgrade:

1. In YaST, click *System* > *System Services (Runlevel)*.
2. Select *Expert Mode*.
3. Select *boot.lvm*.
4. If the boot level (column B) is not marked with a B, then click *Set/Reset* > *Enable the Service*.
5. Select *boot.md*.
6. If the boot level (column B) is not marked with a B, then click *Set/Reset* > *Enable the Service*.
7. Click *Finish*, then click *Yes*.

5.4.2 Upgrading Using a Network Installation Source with DHCP (Offline)

1. Ensure that the server meets the upgrade requirements. See "Meeting the Upgrade Requirements" on page 115.
2. Insert *SuSE Linux Enterprise Server 10 SP3 CD 1* into the CD-ROM drive (or the SP3 DVD in a compatible drive) of the server you want to upgrade to OES 2 SP2 Linux, then reboot the server.
3. From the boot menu, select one of the following Installation options that matches your environment, but do not press Enter.
   - **Installation:** The normal installation mode. All modern hardware functions are enabled.
   - **Installation—ACPI Disabled:** If the normal installation fails, this might be because of the system hardware not supporting ACPI (advanced configuration and power interface). If this seems to be the case, use this option to install without ACPI support.
   - **Installation—Local APIC Disabled:** If the normal installation fails, this might be because of the system hardware not supporting local APIC (advanced programmable interrupt controllers). If this seems to be the case, use this option to install without local APIC support.

     If you are not sure, try I*nstallation—ACPI Disabled* or *Installation—Safe Settings* first.
   - **Installation—Safe Settings:** Boots the system with the DMA mode (for CD-ROM drives) and power management functions disabled. Experts can also use the command line to enter or change kernel parameters.
4. (Conditional) You can enter boot option parameters to specify all the parameters that the manual installation steps will step you through or you can continue with Step 5.

   If you do specify boot options parameters, press Enter then continue with Step 7.

For more information on specifying boot option parameters, see "Using Custom Boot Options" in the *SUSE Linux Enterprise Server Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/sec_deployment_remoteinst_bootinst.html#sec_deployment_remoteinst_bootinst_custom).

5 Press F4, and then select the network installation type (NFS, FTP, HTTP) that you set up on your network installation server.

See Step 2 on page 40 of the Preparing a Network Installation Source procedure.

6 Specify the required information (server name and installation path), then select *OK*.

7 Press Enter to begin the upgrade.

8 Select a language, then click *Next*.

9 On the License Agreement page, click *Yes, I Agree to the License Agreement* > *Next*.

10 Follow the prompts, using the information contained in the following sections:

10a "Selecting the Installation Mode Options" on page 124.

10b "Specifying the Partition to Update" on page 125.

10c "Specifying the Add-On Product Installation Information" on page 127.

10d "Verifying and Customizing the Update Options in Installation Settings" on page 129.

10e "Accepting the Installation Settings" on page 132.

10f "Specifying Configuration Information" on page 133.

10g "Finishing the Upgrade" on page 142.

11 Verify that the upgrade was successful. See the procedures in "Verifying That the Installation Was Successful" on page 72.

12 Complete the server setup by following the procedures in "Completing OES Installation or Upgrade Tasks" on page 145.

5.4.3 Upgrading Using a Network Installation Source without DHCP (Offline)

1 Ensure that the server meets the upgrade requirements. See "Meeting the Upgrade Requirements" on page 115.

2 Insert *SuSE Linux Enterprise Server 10 SP3 CD 1* into the CD-ROM drive (or the SP3 DVD in a compatible drive) of the server that you are upgrading to OES 2 SP2, then reboot the machine.

3 From the CD boot menu, select one of the following Installation options that matches your environment, then press Enter.

- **Installation:** The normal installation mode. All modern hardware functions are enabled.
- **Installation—ACPI Disabled:** If the normal installation fails, this might be because of the system hardware not supporting ACPI (advanced configuration and power interface). If this seems to be the case, use this option to install without ACPI support.
- **Installation—Local APIC Disabled:** If the normal installation fails, this might be because of the system hardware not supporting local APIC (advanced programmable interrupt controllers). If this seems to be the case, use this option to install without local APIC support.

  If you are not sure, try I*nstallation—ACPI Disabled* or *Installation—Safe Settings* first.

- **Installation—Safe Settings:** Boots the system with the DMA mode (for CD-ROM drives) and power management functions disabled. Experts can also use the command line to enter or change kernel parameters.

4 At this point you can pre-specify the IP address information, installation source, etc. on the *Boot Options* line (see "Using Custom Boot Options" in the *SUSE Linux Enterprise Server Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/sec_deployment_remoteinst_bootinst.html#sec_deployment_remoteinst_bootinst_custom)), or you can press Enter, continue with Step 5, and input everything as the install prompts you.

If you want to specify boot options parameters, do it now. Then press Enter and continue with Step 21 on page 121.

5 When you receive the following error, press Enter:

```
Could not find the SUSE Linux Enterprise Server 10 Installation source.
Activating manual set up program.
```

6 Select the language, then select *OK* and press Enter.

7 Select a keyboard map, then select *OK* and press Enter.

8 Select *Start Installation or System*, then select *OK* and press Enter.

9 Select *Start Installation or Update*, then select *OK* and press Enter.

10 Select *Network*, then select *OK* and press Enter.

11 Select the network protocol that matches the configured protocol on your network installation server, then press Enter.

12 (Conditional) If you have more than one network interface card, select one of the cards, then press Enter.

We recommend eth0, provided that it is connected to the subnet for the primary static IP address used by the server you are upgrading.

13 When prompted whether you want to use DHCP, select *No*, then press Enter.

14 Specify the static IP address of the server you are upgrading, then press Enter.

15 Specify the subnet mask, then press Enter.

16 Specify the gateway, then press Enter.

17 Specify the IP addresses a name server, then press Enter.

18 Specify the IP address of the network installation server, then press Enter.

19 (Conditional) Depending on the protocol you specified, you might see additional screens for FTP or HTTP. Select the options that are appropriate for your network, then continue with Step 20.

20 Specify the path to your installation source on the network installation server, then press Enter.

The installation system loads and the YaST install starts.

21 Select the language, then click *Next*.

22 On the License Agreement page, click *Yes, I Agree to the License Agreement* > *Next*.

23 Follow the prompts, using the information contained in the following sections:

23a "Selecting the Installation Mode Options" on page 124.

23b "Specifying the Partition to Update" on page 125.

23c "Specifying the Add-On Product Installation Information" on page 127.

23d “Verifying and Customizing the Update Options in Installation Settings” on page 129.

23e “Accepting the Installation Settings” on page 132.

23f “Specifying Configuration Information” on page 133.

23g “Finishing the Upgrade” on page 142.

24 Verify that the upgrade was successful. See the procedures in “Verifying That the Installation Was Successful” on page 72.

25 Complete the server setup by following the procedures in “Completing OES Installation or Upgrade Tasks” on page 145.

5.4.4 Upgrading Using Physical Media (Offline)

1 Ensure that the server meets the upgrade requirements. See “Meeting the Upgrade Requirements” on page 115.

2 Insert the *SuSE Linux Enterprise Server 10 SP3 CD 1* or *SuSE Linux Enterprise Server 10 SP3 DVD 1* into the CD-ROM or DVD drive of the server that you are upgrading to OES 2 SP2, then reboot the machine.

3 From the CD boot menu, select the *Installation* option that best fits your environment, then press Enter.

4 Select the language that you want to use.

5 On the License Agreement page, click *Yes, I Agree to the License Agreement* > *Next*.

6 Follow the prompts, using the information contained in the following sections:

6a “Selecting the Installation Mode Options” on page 124.

6b “Specifying the Partition to Update” on page 125.

6c “Specifying the Add-On Product Installation Information” on page 127.

6d “Verifying and Customizing the Update Options in Installation Settings” on page 129.

6e “Accepting the Installation Settings” on page 132.

6f “Specifying Configuration Information” on page 133.

6g “Finishing the Upgrade” on page 142.

7 Verify that the upgrade was successful. See the procedures in “Verifying That the Installation Was Successful” on page 72.

8 Complete the server setup by following the procedures in “Completing OES Installation or Upgrade Tasks” on page 145.

5.4.5 Upgrading Using the Patch Channel (Online)

- “Before You Start the Upgrade” on page 123
- “Creating a Password Answer File” on page 123
- “Performing the Upgrade” on page 123

Before You Start the Upgrade

Understand the following:

- You might notice that the SLES documentation refers to this upgrade method as an "online migration." In OES, "migration" implies moving to a new architecture or platform.

  Don't be confused by the SLES terminology when, for example, you add "migration" products to your upgrade channels.
- The SLES "move-to-sles10-sp3" patch cannot be used to migrate OES 2 SP2.
- The OES server being upgraded must be running OES 2 SP1 with the latest patches applied. See Table 5-1 on page 113.
- You can perform a "silent" patch channel upgrade by creating an answer file that contains the LDAP (eDirectory) Admin user password and, if you are installing Domain Services for Windows, the optional Domain Administrator password. Instructions for doing this are in "Creating a Password Answer File" on page 123.

  If you prefer to enter the passwords manually after the software has been updated, skip to "Performing the Upgrade" on page 123.

Creating a Password Answer File

If you want the upgrade process to run without user intervention after the software is updated, you can create an answer file for the YaST install by doing the following, either on an OES 2 SP2 server, or on an SP1 server just prior to rebooting it (see Step 7 on page 124).

1. As `root`, open a terminal prompt.
2. Enter the following command:

   ```
   sudo yast2 create-answer-file ldap_password optional_domain_admin_password
   ```

   where *ldap_password*=the LDAP (eDirectory) Admin password and *optional_domain_admin_password*=the DSfW Domain Administrator's password (if applicable).
3. Copy the resulting file named `answer` from the current working directory to `/opt/novell/oes-install`.
4. Continue with Performing the Upgrade.

Performing the Upgrade

1. Ensure that the server meets the upgrade requirements. See "Meeting the Upgrade Requirements" on page 115.
2. Install the `move-to-oes2-sp2` patch on the server. This is an optional patch and will never be installed automatically.

   2a If you are using rug, enter the following command at a terminal prompt:

   ```
   rug in -t patch move-to-oes2-sp2 && rug ping -a
   ```

   2b If you are using the GUI Software Updater, click the Software Updater icon, then select the `move-to-oes2-sp2` patch, and click *Update*.
3. Answer all of the prompts that display in the affirmative until the `move-to-oes2-sp2` patch is installed.

4 Verify that the *Novell-Open-Enterprise-Server-SP2-migration* and *SUSE-Linux-Enterprise-Server-SP3-migration* products are installed along with their associated channels at a terminal prompt by entering:

```
rug pd -i
```

5 Install the recommended patches that are in the channels.

5a If you are using rug, enter:

```
rug up -t patch -g recommended && rug ping -a
```

5b If you are using the GUI Software Updater, click the *Update* button.

6 Repeat Step 5, answering all of the prompts in the affirmative until you are prompted to reboot server.

7 (Optional) At this point you can create an answer file if desired. See "Creating a Password Answer File" on page 123.

8 Reboot the server.

9 If you did not provide a password answer file (Creating a Password Answer File (page 123)), you must enter the passwords for the LDAP (eDirectory) Admin user and (if applicable) the DSfW Domain Administrator to start the configuration process.

If you provided an answer file, the service configuration process continues automatically.

IMPORTANT: If an error occurs, for example if the wrong password is entered, you can rerun the configuration phase again by either

- Rebooting the server

  or

- Entering the following command at a terminal prompt:

  ```
  sudo yast2 channel-upgrade-oes
  ```

---

10 Various messages indicate the services being configured. When the Login prompt appears, verify that the upgrade was successful. See the procedures in "Verifying That the Installation Was Successful" on page 72.

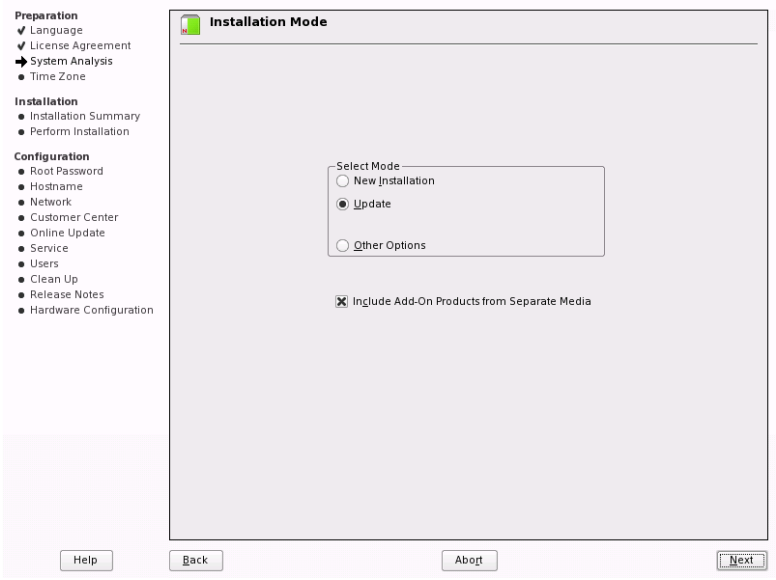
11 Complete the server setup by following the procedures in "Completing OES Installation or Upgrade Tasks" on page 145.

5.4.6 Selecting the Installation Mode Options

1 When the *Installation Mode* screen displays, select the following menu options:

1. *Update*
2. *Include Add-On Products from Separate Media*

IMPORTANT: To upgrade previously installed OES services and install any additional OES services, you must select the *Include Add-On Products from Separate Media* option. If you don't, the server is only updated to SLES 10 SP3 and none of the OES services are upgraded.



2 Click *Next*.

3 Continue with "Specifying the Partition to Update" on page 125 or "Specifying the Add-On Product Installation Information" on page 127, depending on which matches your installation.

5.4.7 Specifying the Partition to Update

YaST tries to determine which is the correct root (/) partition. If there are several possibilities, or if YaST can't definitely determine the correct root partition, the Select for Update page displays.

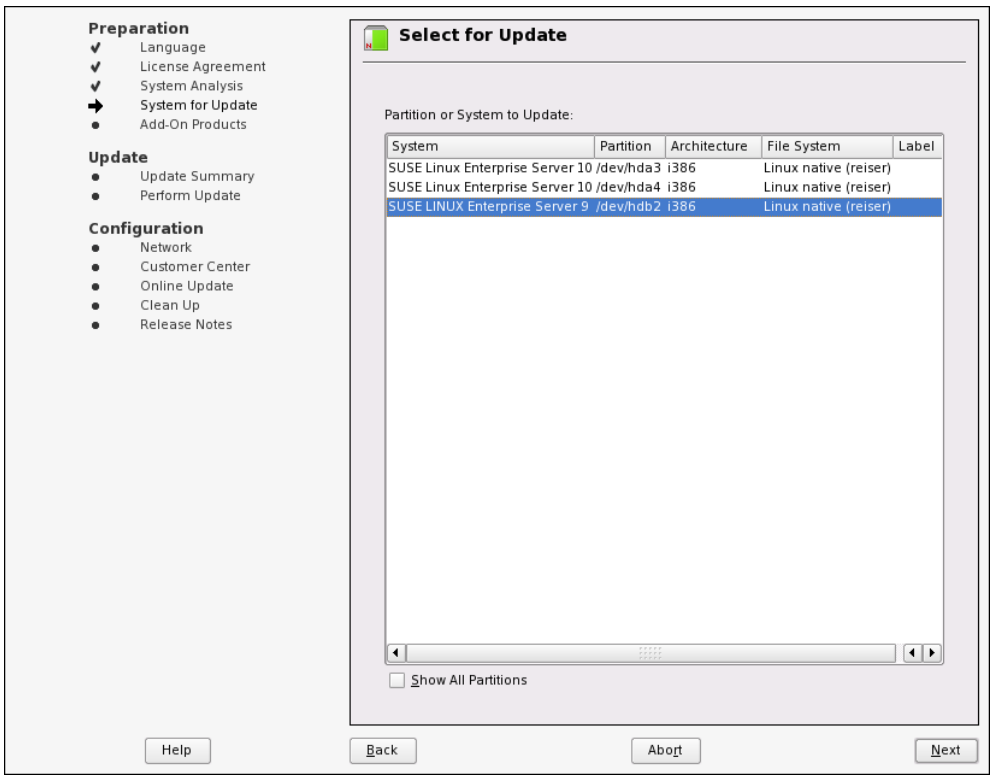
IMPORTANT: If no partitions are listed, you are attempting to upgrade an i386 installation using x86_64 media. Mixing architectures in an upgrade is not permitted. See Section 5.1, "Supported Upgrade Paths," on page 113. You must start the upgrade again using i386 installation media.

1 If there is only one partition listed, click *Next*.

2 If there are several partitions, select the partition with `/evms` in the path.

For example, make sure you select the `/dev/evms/lvm/...` partition rather than the `/dev/lvm/...` partition.

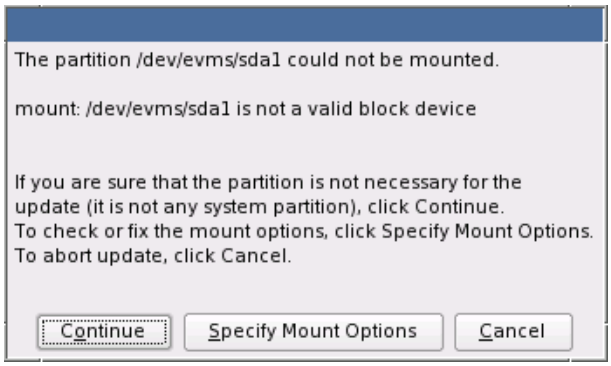
then click *Next*. YaST reads the old fstab on this partition to analyze and mount the file systems listed there.



3 Next, YaST tries to mount the boot (`/boot`) partition.

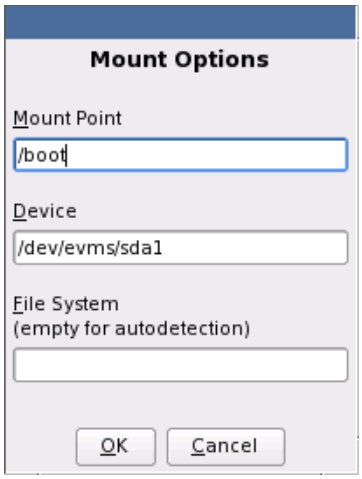
If no error displays, skip to "Specifying the Add-On Product Installation Information" on page 127.

4 If you have EVMS on your system disk, you might get an error stating that the partition could not be mounted:

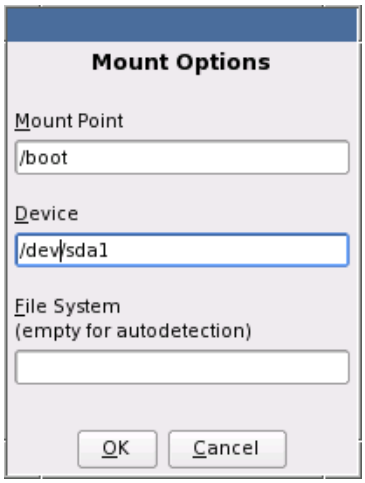


If this error displays, click *Specify Mount Options*.

The Mount Options dialog appears.



5 Remove `/evms` from the *Device* path.



6 Click *OK*.

TIP: In rare cases, the same disks are reported as hard disk devices (hda, etc.) on SLES 9 and SCSI disk devices (sda, etc.) on SLES 10.

If after removing /evms from the device path, you still see the error in Step 4, try changing the path to use sda instead of hda.

---

7 Continue with "Specifying the Add-On Product Installation Information" on page 127.

5.4.8 Specifying the Add-On Product Installation Information

1 When the *Add-On Product Installation* page displays, click *Add*.

2 In the Add-On Product Media dialog, if you are installing from physical media, click *CD* > *Next*.

2a In the Insert the Add-On Product CD dialog, select the appropriate drive where you want to insert the CD labeled *Novell Open Enterprise Server 2 SP2 CD 1* if there is more than one drive, then click *Eject*.

2b Insert the CD labeled *Novell Open Enterprise Server 2 SP2 CD 1*, then click *Continue*.

3 If you are using an alternate installation source, such as a network location, click the appropriate option, such as the network protocol that matches your installation source, then click *Next* and specify the information for the source you have specified.

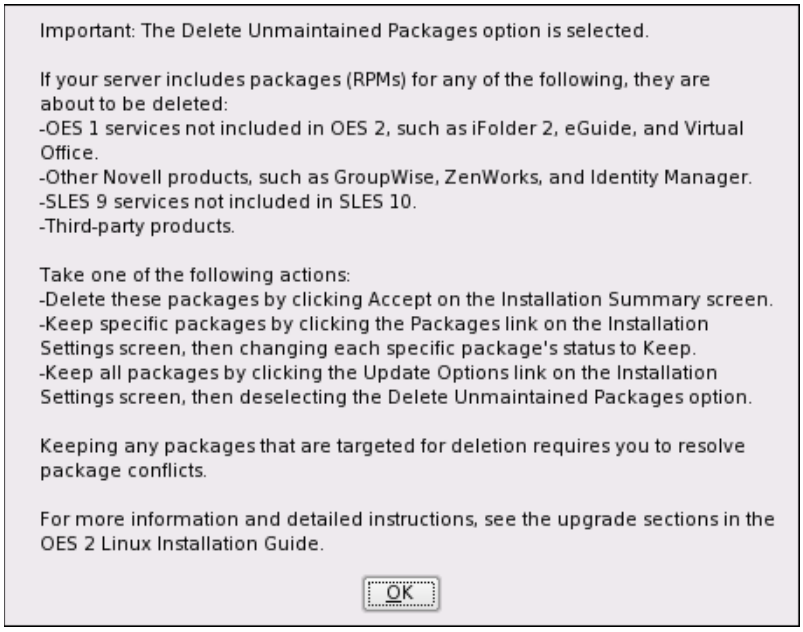
4 Read and accept the Novell Open Enterprise Server 2 license agreement, then click *Next*.

5 Confirm that the Add-On Product Installation page shows the correct path to the OES media, then click *Next*.

6 If you are upgrading from OES 1 SP2, continue with "Reviewing the Delete Unmaintained Packages Notification" on page 128. Otherwise, skip to "Verifying and Customizing the Update Options in Installation Settings" on page 129.

5.4.9 Reviewing the Delete Unmaintained Packages Notification

After the OES 2 SP2 installation source has been added, if you are upgrading from OES 1 SP2, the following notification is displayed:



1 Carefully read the notification.

2 Decide how you want to proceed. For more information, see "OES 1 Server Upgrades: Non-OES 2 Packages Are Deleted by Default:" on page 114.

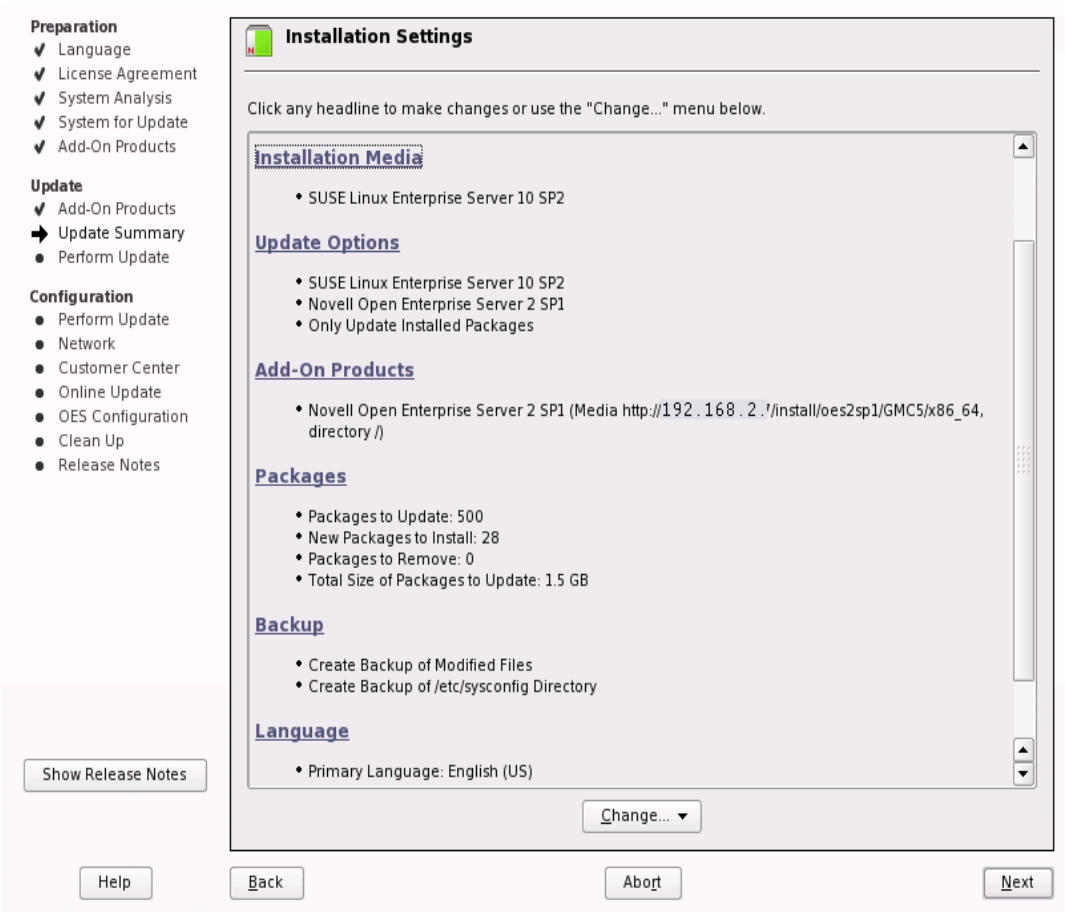
3 Click *OK*, then continue with Verifying and Customizing the Update Options in Installation Settings.

5.4.10 Verifying and Customizing the Update Options in Installation Settings

IMPORTANT: To verify that previously installed services are selected for installation and to install any additional OES services during the upgrade, you must customize the Update Options on the Installation Settings dialog.

To verify or customize the software packages that are installed on the server:

1 On the Installation Settings dialog, make sure Novell Open Enterprise Server 2 is listed under the *Add-On Products* link. If it is, proceed with Step 2.

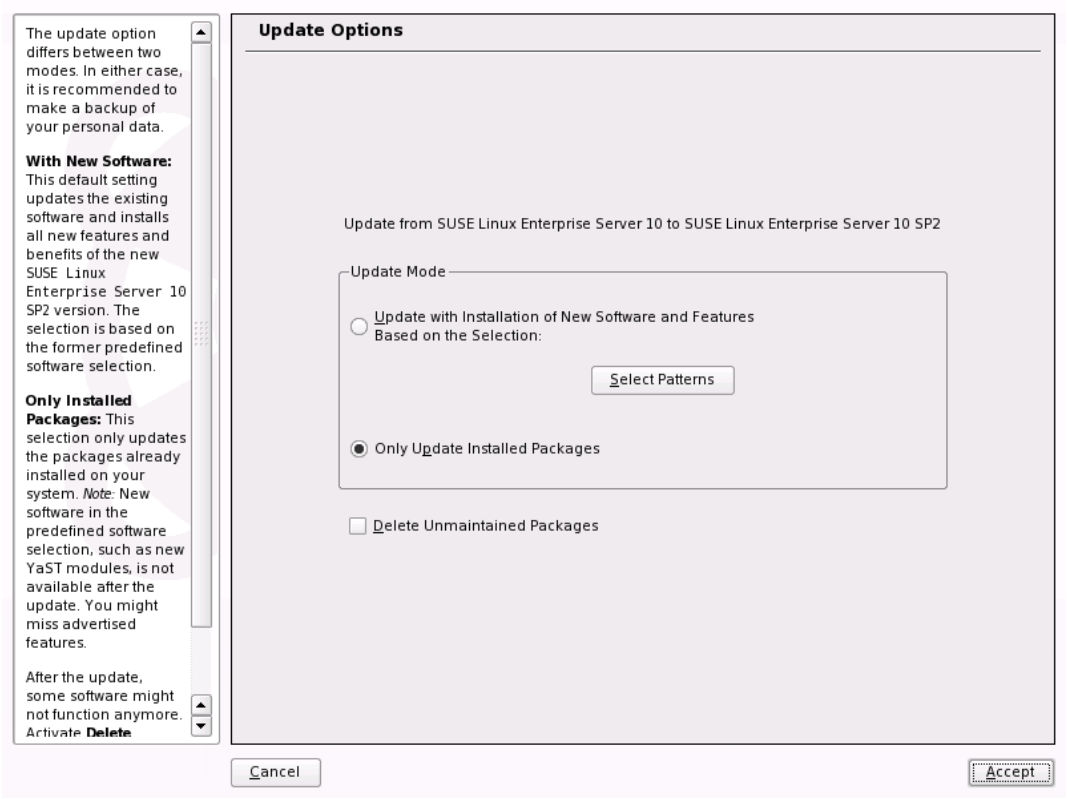


If it is not, click the *Add-On Products* link and follow the steps in "Specifying the Add-On Product Installation Information" on page 127. When the Installation Setting dialog shows Novell Open Enterprise Server 2 as an installation setting, proceed with Step 2.

2 If you see package conflict errors (red text under the *Packages* link), refer to the *OES 2 SP2: Readme* for resolution instructions.

3 On the Installation Settings dialog, click *Update Options*.

4 In the Update Options dialog, click *Select Patterns*.



5 All of the OES Services patterns that were previously installed are selected by default.

Ensure that the patterns for the services you are upgrading are selected, and select the patterns for any new OES Services patterns that you might want to also install, such as Novell AFP or Novell CIFS.

A description of each pattern displays to the left of the pattern when it is selected. For a description of OES Services patterns and the components selected with each pattern, see Table 2-4 on page 29.

Some OES services, such as Novell CIFS and Novell Samba are not supported together on the same server. For more information about unsupported service combinations, see "Unsupported Service Combinations" in the *OES 2 SP2: Planning and Implementation Guide*.

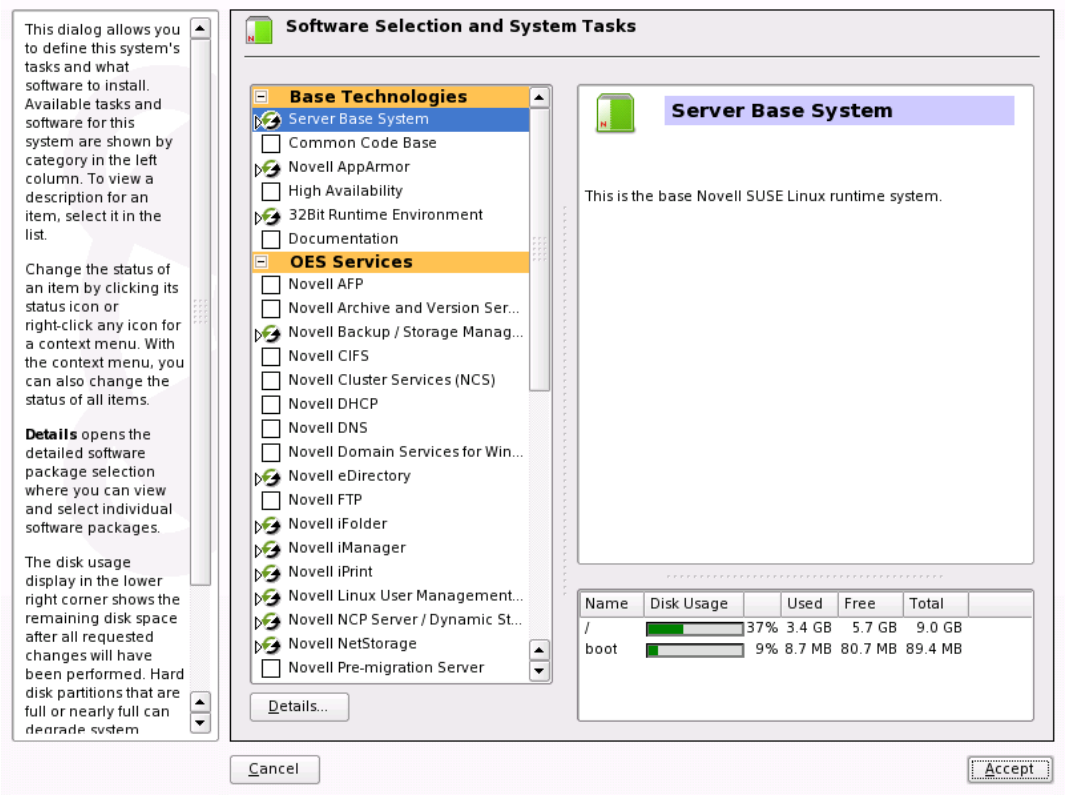
IMPORTANT: If you deselect a pattern after selecting it, you are instructing the installation program to not install that pattern and all of it dependent patterns. Rather than deselecting a pattern, click *Cancel* to cancel your software selections, then click the *Select Patterns* heading again to choose your selections again.

Selecting only the patterns that you want to install ensures that the patterns and their dependent patterns and packages are installed.

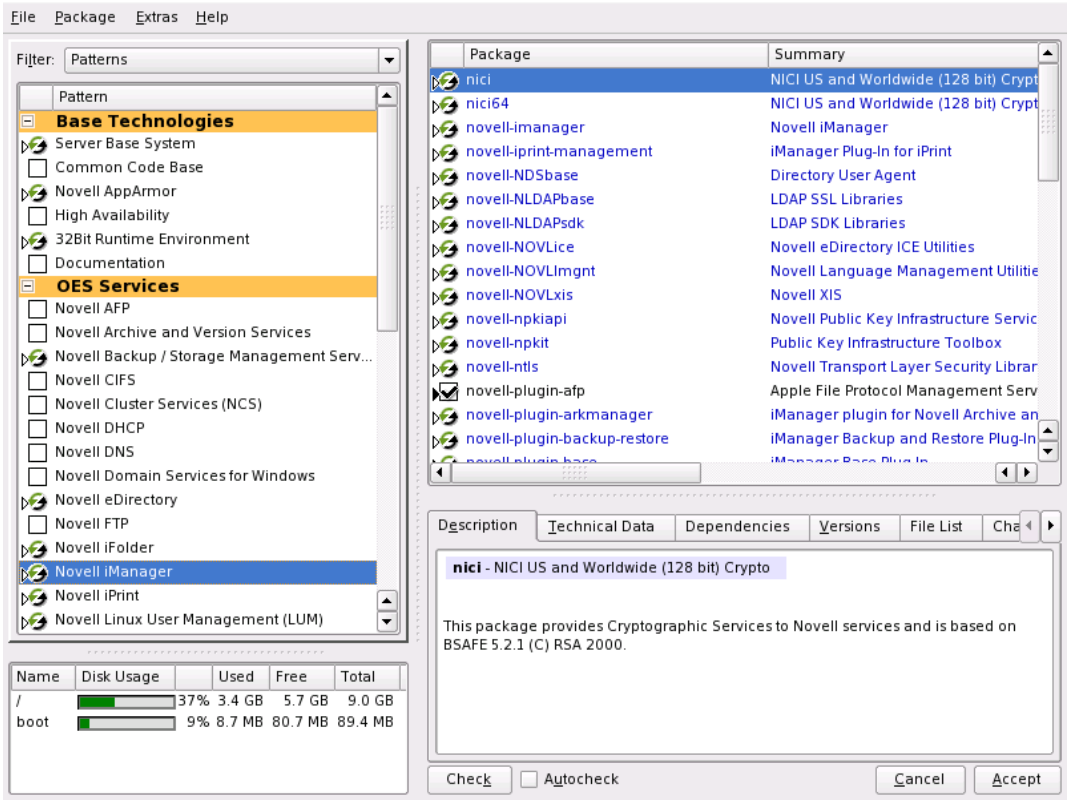
If you click *Accept*, then return to software pattern selection page, the selections that you made become your base selections and must be deselected if you want to remove them from the installation proposal.

Be aware also that attempting to uninstall a service by deselecting its pattern is not recommended. For more information, see Chapter 13, "Disabling OES 2 Services," on page 209.

Selecting a pattern automatically selects the other patterns that it depends on to complete the installation.



6 If you want to see the details of your selections, click *Details*.



7 When you have the software components selected that you want to install, click *Accept*.

8 (Conditional) If the prompt for the AGFA Fonts license displays, read the agreement, then click *Accept*.

9 (Conditional) If you decided to delete unmaintained packages in Section 5.4.9, “Reviewing the Delete Unmaintained Packages Notification,” on page 128, the notification appears again. Click *OK*.

10 (Conditional) If the prompt for *Automatic Changes* displays, click *Continue*.

11 (Conditional) If prompted, resolve any dependency conflicts.

12 If the Update Options dialog displays again, click *Accept*.

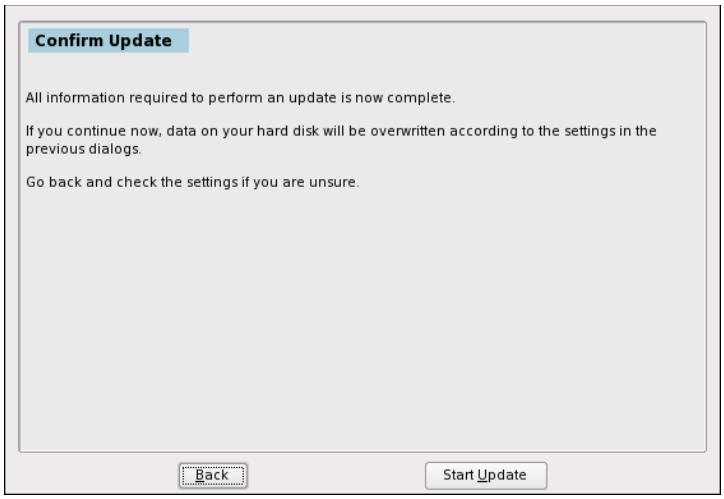
13 Continue with “Accepting the Installation Settings” on page 132.

5.4.11 Accepting the Installation Settings

1 Review the final Installation Settings page to ensure that you have all the Installation settings you desire. Make sure that it shows all the OES Services that you want to update and install.

2 After you have changed all the Installation Settings as desired, click *Accept*.

3 In the Confirm Update dialog, click *Start Update*.



The base installation settings are applied and the packages are installed.

4 While the server is updating the files, do one of the following:

- For installations using a network installation source, remove the boot CD (*SUSE Linux Enterprise Server 10 SP2 CD 1*) from the CD drive.
- For installations using a CD or DVD installation source, leave the CD or DVD in the CD-ROM or DVD drive. When the installation process prompts you for each CD at the appropriate time, insert the CD. The progress status at the bottom of the screen indicates which CD will be prompted for next.

5 After the server reboots, continue with "Specifying Configuration Information" on page 54.

TIP: If you have the disk driver situation mentioned in Step 7 on page 127, your server will boot to a prompt for the root password. Specify the password, and then use an editor such as VI to modify the /etc/fstab file so that the path to the boot partition uses sda instead of hda. Then reboot the server. The upgrade should continue normally.

5.4.12 Specifying Configuration Information

When the server reboots, you are required to complete the following configuration information:

- "Testing the Connection to the Internet" on page 133
- "Specifying Novell Customer Center Configuration Settings" on page 134
- "Updating the Server Software During the Upgrade" on page 136
- "Upgrading eDirectory" on page 139
- "Specifying LDAP Configuration Settings" on page 140
- "Configuring Novell Open Enterprise Server Services" on page 141

Testing the Connection to the Internet

On the *Test Internet Connection* page:

1 Select *Yes*, *Test Connection to the Internet*, then click *Next*.

Obtaining the latest SUSE release notes might fail at this point. If it does, view the log to verify that the network configuration is correct, then, click *Next*.

If the network configuration is not correct, click *Back* > *Back* and fix your network configuration. See "Network Interface" on page 55. The most common problem is that a valid DNS server is specified.

2 Or, you can skip this test by clicking *No, Skip This Test*; however, most OES services configuration require a connection to the Internet.

Skipping this test also skips downloading release notes, configuring the Novell Customer Center, and updating online.

3 Continue with "Specifying Novell Customer Center Configuration Settings" on page 134. If you skip this test, continue with "Upgrading eDirectory" on page 139.

Specifying Novell Customer Center Configuration Settings

To receive support and updates for your OES 2 SP2 server, you need to register it in the Novell Customer Center (NCC). When the Novell Customer Center Configuration page is displayed, you have three options:

- "Updating a Registered Server" on page 134
- "Registering the Server Later / Skipping a Registered Server Update" on page 134
- "Registering the Server During the Upgrade" on page 134

Updating a Registered Server

1 If you have already registered your OES 2 server and you want to download the available patches, which is recommended, leave *Configure Now* selected and click Next.

YaST contacts the server (which might take a few minutes) and then downloads the available patches.

2 Go to Step 7 on page 136.

Registering the Server Later / Skipping a Registered Server Update

To register the server later or to skip the update process for a registered server:

1 Click *Configure Later*.

2 Continue with "Upgrading eDirectory" on page 139.

3 Register the server after the installation is complete by using the procedures in Section 7.3, "Registering the Server in the Novell Customer Center," on page 151.

Registering the Server During the Upgrade

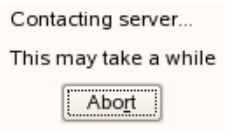
To register the server during the upgrade:

1 On the Novell Customer Center Configuration configuration page, select all of the following options, then click *Next*.

Option	What it Does
Configure Now	Proceeds with registering this server and the SLES 10 SP3 and OES product in the Novell Customer center.

Option	What it Does
Hardware Profile	Sends the information to the Novell Customer Center about the hardware that you are installing SLES 10 SP1 and OES 2 on.
Optional Information	Sends optional information to the Novell Customer Center for your registration. For this release, this option doesn't send any additional information.
Registration Code	Makes the registration with activation codes mandatory.
Regularly Synchronize with the Customer Center	Keeps the installation sources for this server valid. It does not remove any installation sources that were manually added.

2 After you click *Next*, the following message is displayed. Wait until this message disappears and the Manual Interaction Required page displays.

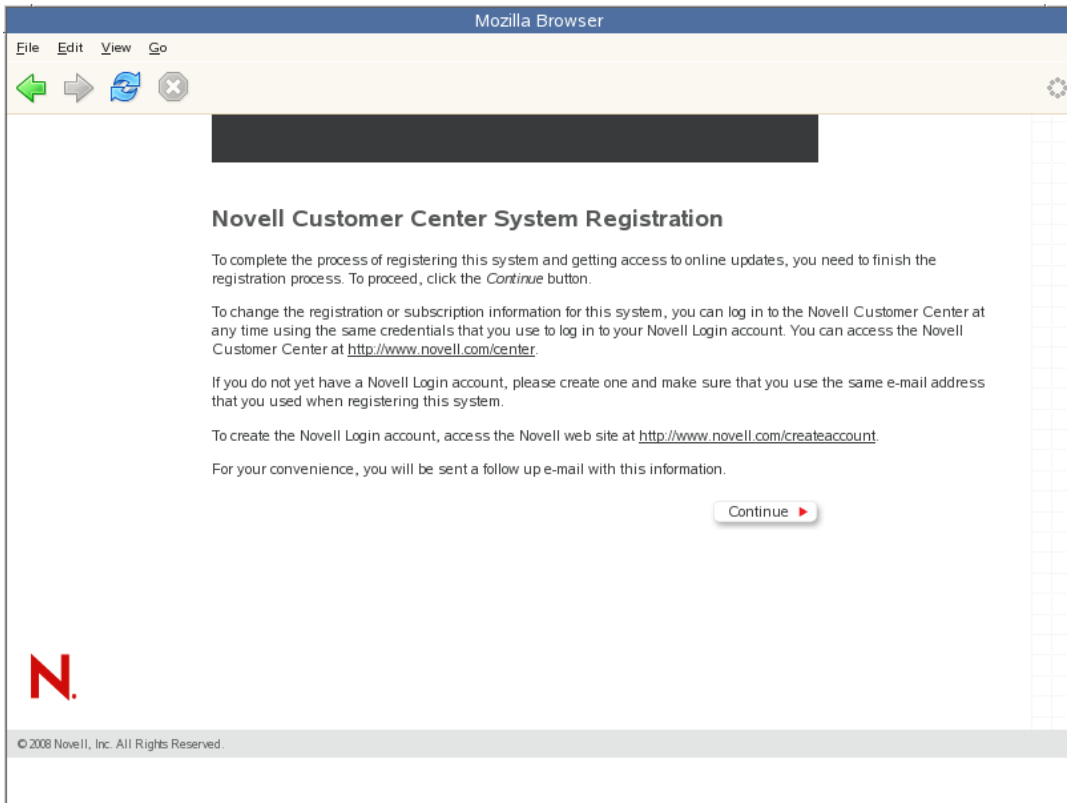


3 On the Manual Interaction Required page, note the information that you will be required to specify, then click *Continue*.

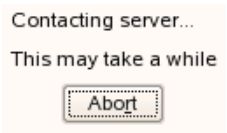
4 On the Novell Customer Center Registration page, specify the required information in the following fields, then click *Submit*:

Field	Information to Specify
Email Address	The e-mail address for your Novell Login account.
Confirm Email Address	The same e-mail address for your Novell Login account
Activation Code for SLES Components (optional):	Specify your purchased or 60-day evaluation registration code for the SLES 10 product. If you don't specify a code, the server cannot receive any updates or patches.
Activation Code for OES Components (optional):	Specify your purchased or 60-day evaluation registration code for the OES 2 product. If you don't specify a code, the server cannot receive any updates or patches.
System Name or Description (optional):	The hostname for the system is specified by default. If you want to change this to a description, for the Novell Customer Center, specify a description to identify this server.

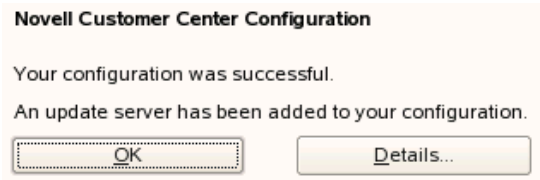
5 When the message to complete the registration displays, click *Continue*.



6 After you click *Continue*, the following message is displayed with the Manual Interaction Required screen. Wait until this message disappears and Novell Customer Center Configuration page displays with the message that `Your configuration was successful`.



7 When you see the message `Your configuration was successful` on the Novell Customer Center Configuration, click *OK*.



8 Continue with "Updating the Server Software During the Installation" on page 60.

Updating the Server Software During the Upgrade

If you have a successful connection to the Internet and have registered the server in the Novell Customer Center, the server displays the Online Update dialog. You can run the online update now or skip it and get updates later.

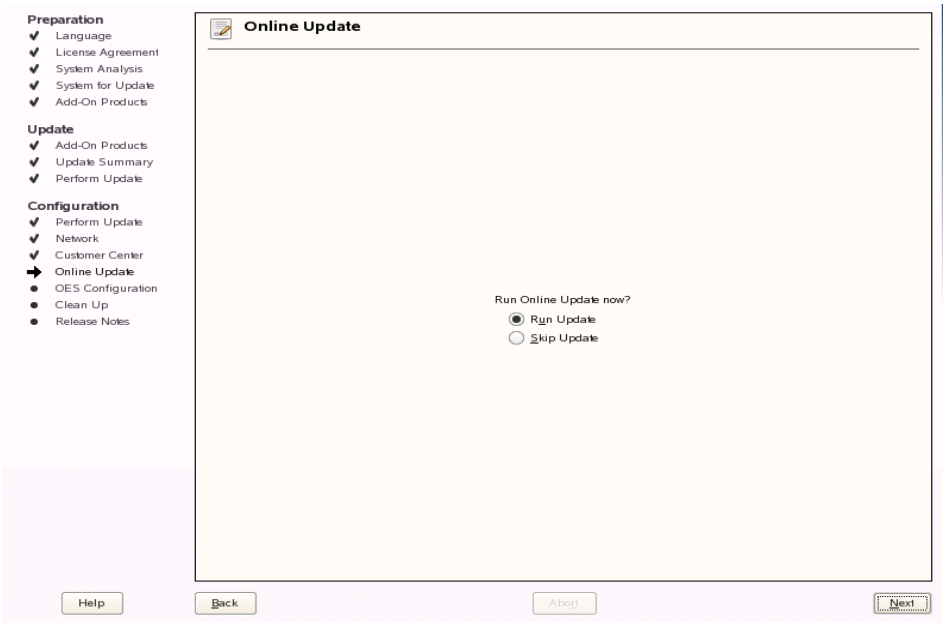
To skip getting updates during the upgrade

1 On the Online Update page, click *Skip Update*.

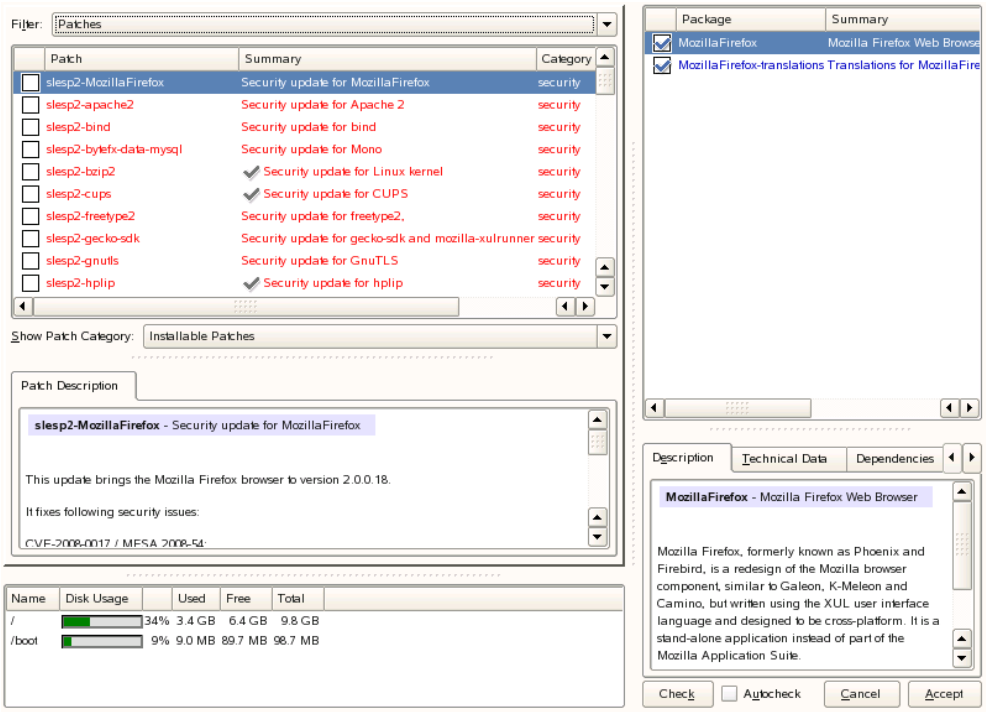
2 Continue with “Upgrading eDirectory” on page 139.

To get updates during the upgrade:

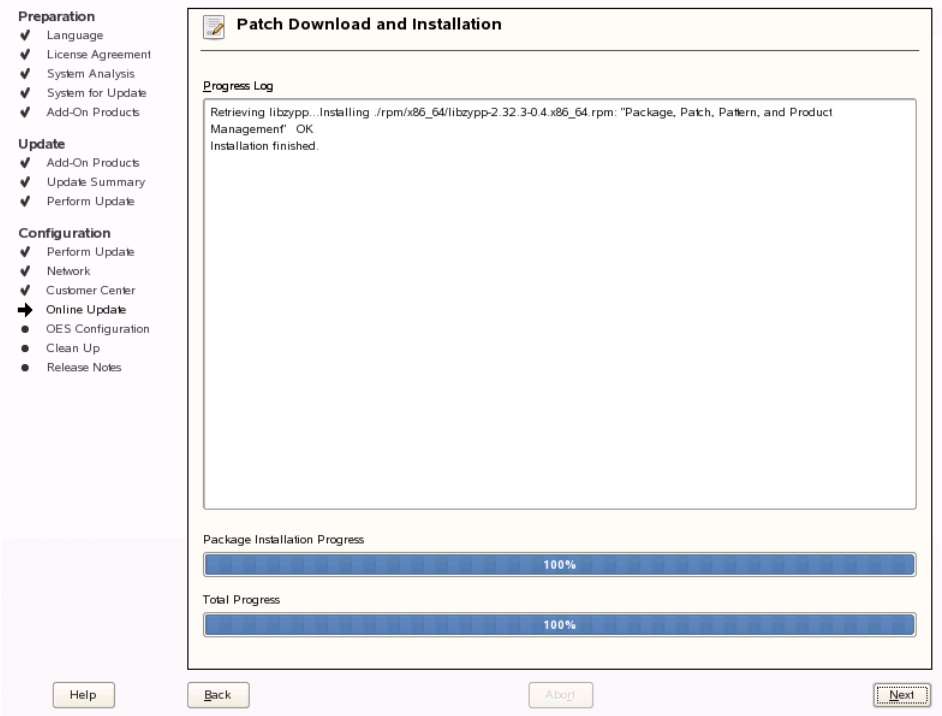
1 On the Online Updates page, click *Run Update*.



2 On the page that shows that updates are available, select the updates that you want to install, then click *Accept*. The check marks that are shown in the summary column of the patches list are the patches that have already been installed on your system.



3 When you see the message, `Installation finished` on the Patch Download and Installation page, click *Next*.

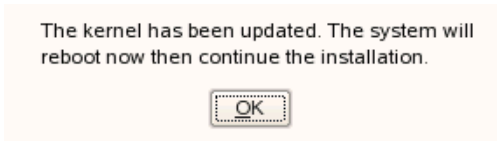


4 If the update makes changes to YaST, the following message displays. Click *OK* to restart YaST.

If the installation was interrupted, the following message might display. If so, click *Yes* to continue with the installation and enter the `root` password.

5 The online update displays again with additional updates. If a patch has changes to the kernel, you might want to deselect it and install it later after the installation is complete. For procedures, see "Updating (Patching) an OES 2 SP2 Server" on page 149.

If you do install patches that have changes to the kernel, click *OK* when you see the following message.

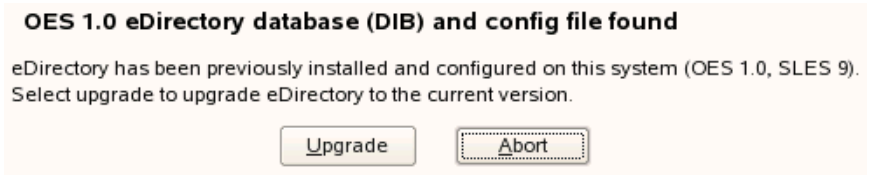


6 After all the patches are installed, continue with "Upgrading eDirectory" on page 139.

Upgrading eDirectory

OES 2 SP2 includes eDirectory 8.8.4.

1 When the following dialog appears, click *Upgrade*.



2 On the eDirectory Upgrade - Existing Server Information page, type the Admin password.

3 If you are upgrading from OES 1 SP2 and you don't have a third-party CA certificate installed on the server, you should consider selecting the Use eDirectory Certificates for HTTPS services. For more information, see the explanation in the installation instructions, Step 3 on page 66, and the information in "Certificate Management" in the *OES 2 SP2: Planning and Implementation Guide*.

4 On the Novell Modular Authentication Service page, click *Next*.

5 Continue with with "Specifying LDAP Configuration Settings" on page 140.

Specifying LDAP Configuration Settings

Many of the OES services require eDirectory. If eDirectory was not selected as a product to upgrade or install but other OES services that do require LDAP services were installed, the LDAP Configuration service displays expecting you to in complete the required information.

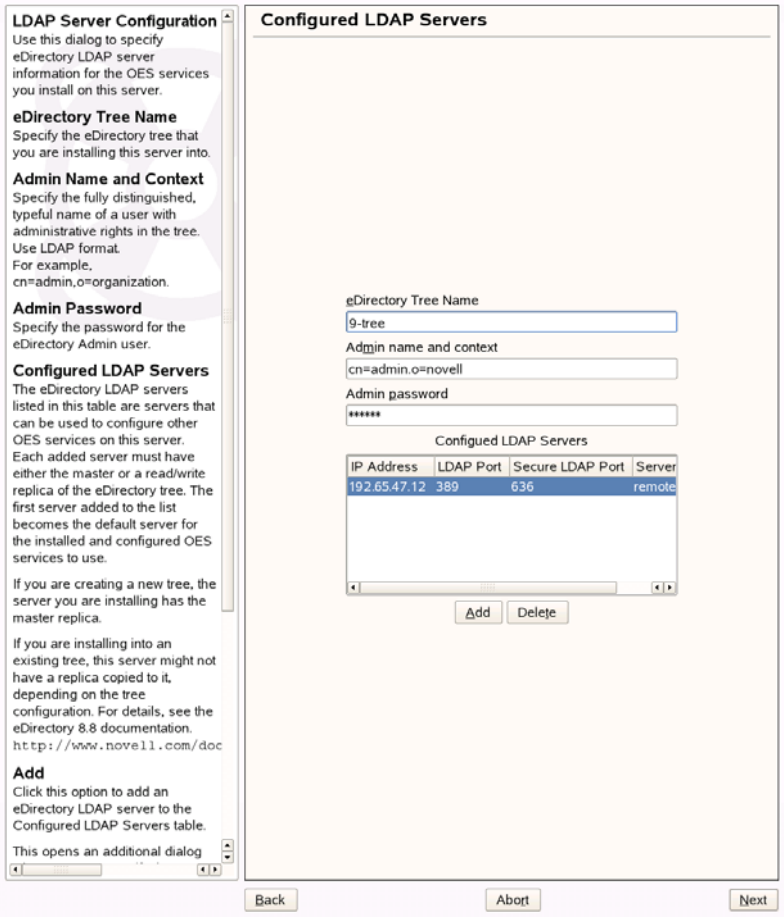
To specify the required information on the Configured LDAP Server page:

1. In the *eDirectory Tree Name* field, specify the name for the existing eDirectory tree that you are installing this server into.
2. In the *Admin Name and Context* field, specify the name and context for user Admin on the existing tree.
3. In the *Admin Password Name* field, specify a password for user for user Admin on the existing tree.
4. Add the LDAP servers that you want the services on this server to use. The servers that you add should hold the master or a read/write replica of eDirectory. Do the following for each server you want to add.

   4a Click Add.

   4b On the next dialog, specify the following information for the server to add, then click *Add*.

   - IP Address
   - LDAP port and secure LDAP port

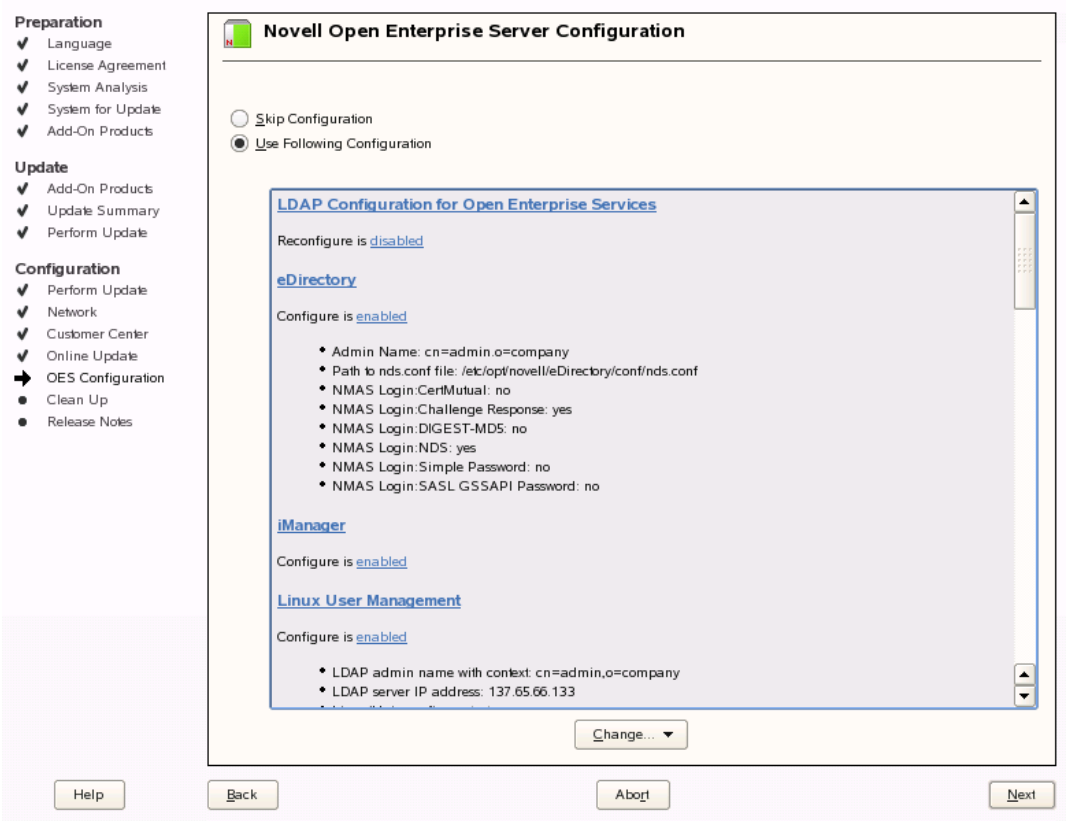


5 When all the LDAP servers that you want to specify are listed, click *Next*.

6 Continue with "Configuring Novell Open Enterprise Server Services" on page 141.

Configuring Novell Open Enterprise Server Services

1 After you complete the LDAP configuration or eDirectory configuration, the *Novell Open Enterprise Server Configuration* summary page is displayed, showing all the OES components you updated and installed and their configuration settings. Review the setting for each component and click the component heading to change any settings.



When specifying the configuration information for OES services, see the information in "Guidelines for Configuring OES 2 SP2 Components" on page 73.

2 When you are satisfied with the settings for each component, click *Next*.

3 When confirming the OES component configurations, you might receive the following error:

```
The proposal contains an error that must be resolved before continuing.
```

If this error is displayed, check the summary list of configured products for a message immediately below each product heading that indicates the product or service needs to be configured. If you are running the YaST graphical interface, the text appears red. If you are installing using the YaST text-base interface, it is not red.

For example, if you have selected Linux User Management in connection with other OES products or services, you might see a message similar to the following:

```
Linux User Management needs to be configured before you can continue or
disable the configuration.
```

If you see a message like this, do the following:

3a On the summary page, click the heading for the component.

3b Supply the missing information in each configuration page.

When specifying the configuration information for OES services during the upgrade, see the information in "Guidelines for Configuring OES 2 SP2 Components" on page 73.

When you have finished the configuration of that component, you are returned to the *Novell Open Enterprise Server Configuration* summary page.

3c If you want to skip the configuration of a specific component and configure it later, click *Enable*d in the *Configuration is enabled* status to change the status to *Configuration is disabled*.

If you change the status to *Configuration is disabled*, you must configure the OES components after the installation is complete. See "Installing/Configuring OES 2 SP2 on an Existing Server" on page 107.

4 After resolving all product configuration problems, click *Next* to proceed with the configuration of all services and installation of iManager Plug-ins.

5 When the Readme page displays, click *Next* and continue with Section 5.5, "Finishing the Upgrade," on page 142.

5.5 Finishing the Upgrade

After a successful configuration, YaST shows the Installation Completed dialog. In this dialog, do the following:

1 Deselect *Clone This System for AutoYaST*. Cloning is selected by default.

This will increase the speed of finishing the installation update.

AutoYaST is a system for automatically installing one or more SUSE Linux Enterprise systems without user intervention. Although you can create a profile from a system that has been upgraded, it will not work to upgrade a similar system.

2 Finish the upgrade by clicking *Finish* in the Installation Completed dialog.

3 If you have upgraded a server that has NSS pools and volumes on the system device (the device that contains the root (`/`), `/boot`, and `swap` partitions), you must do the following:

3a Verify that the `/etc/fstab` file is correct. For example, make sure that the path to `/boot` is complete—`/dev/evms/sda1` (or `hda1`) and not just `/dev/evms`. If the path to the `/boot` partition is incomplete or doesn't contain `/evms`, change it and save the `fstab` file.

3b Open a terminal and run the following command to ensure that the `initrd` file is correctly created:

```
mkinitrd -f evms
```

3c Reboot the server before continuing with "Verifying That the Upgrade Was Successful" on page 143.

A script runs automatically during the OES 2 SP2 Linux upgrade to install and enable `boot.evms`.

These changes are applied when you reboot your system after the upgrade is completed. Make sure that you reboot after the upgrade and before you do anything that would alter the changes made in this step.

4 After the server completes the upgrade, continue with "Verifying That the Upgrade Was Successful" on page 143.

5.6 Verifying That the Upgrade Was Successful

One way to verify that your OES server upgrade was successful and that the components are loading properly is to watch the server boots. As each component is loaded, the boot logger provides a status next to it indicating if the component is loading properly.

You can also quickly verify a successful installation by accessing the server from your Web browser.

1 In the Address field of your Web browser, enter the following URLs:

http://*IP_or_DNS*

where *IP_or_DNS* is the IP address or DNS name of your OES server.

You should see a Web page displayed similar to the following:

2 (Optionally) If you want to look at the eDirectory tree and begin to see how iManager works, click the Management Services home page, click *Management Tools* > *iManager*, and then log in as user Admin (the user you created during product installation).

   You can also access iManager by typing the following URL in a browser window and logging in as user Admin:

   `http://IP_or_DNS_name/nps/iManager.html`

3 Continue with "What's Next" on page 144.

5.7 What's Next

After you've completed the upgrade and verified that it was successful, see "Completing OES Installation or Upgrade Tasks" on page 145 and "Updating (Patching) an OES 2 SP2 Server" on page 149.

Completing OES Installation or Upgrade Tasks

6

This section provides information for completing the following tasks:

6.1 Determining Which Services Need Additional Configuration

NOTE: For information on configuring OES services as a different administrator than originally installed the OES server, see Section 2.5.3, “Adding/Configuring OES Services As a Different Administrator,” on page 21.

Depending on the products you have installed, there might be some tasks that you must complete before you can use individual service components.

For more information, see “Caveats for Implementing OES 2 Services” in the *OES 2 SP2: Planning and Implementation Guide*.

If a component requires additional configuration that is not part of the Novell® Open Enterprise Server (OES) 2 Linux installation, see the component's administration guide for more information. The following table include links to the Installation and Configuration information for most OES 2 SP2 services.

Table 6-1 *OES 2 SP2 Services Additional Installation and Configuration Instructions*

OES 2 SP2 Service	For Additional Installation and Configuration Information
Domain Services for Windows	See “Installing Domain Services for WindowsInstalling and Setting Up AFP” in the *OES 2 SP2: Domain Services for Windows Administration Guide*.
Novell AFP	See “Installing and Setting Up AFP” in the *OES 2 SP2: Novell AFP For Linux Administration Guide*.
Novell Archive and Version Services	See “Setting Up Archive and Version Services ” in the *OES 2 SP1: Novell Archive and Version Services 2.1 for Linux Administration Guide*.

OES 2 SP2 Service	For Additional Installation and Configuration Information
Novell Backup/Storage Management Services (SMS)	See "Installing and Configuring SMS" in the *OES 2 SP1: Storage Management Services Administration Guide*.
Novell CIFS	See "Installing and Setting Up AFPInstalling and Setting Up CIFS" in the *OES 2 SP2: Novell CIFS for Linux Administration Guide*.
Novell Cluster Services™	See "Installing Novell Cluster Services on OES 2 Linux" in the *OES 2 SP2: Novell Cluster Services 1.8.7 for Linux Administration Guide*.
Novell DHCP	See "Installing and Configuring DHCP " in the *OES 2 SP2: Novell DNS/DHCP Administration Guide for Linux*.
Novell DNS	See "Installing and Configuring DNS " in the *OES 2 SP2: Novell DNS/DHCP Administration Guide for Linux*.
Novell eDirectory™ 8.8	See "Installing or Upgrading Novell eDirectory on Linux" in the *Novell eDirectory 8.8 Installation Guide*.
Novell iFolder® 3.8	When you configure iFolder as part of the OES install and configuration, you can specify only an EXT3 or ReiserFS volume location for the System Store Path, which is where you are storing iFolder data for all your users. You cannot create NSS volumes during the system install. If you want to use an NSS volume to store iFolder data, you must reconfigure iFolder after the initial OES installation. To reconfigure, use Novell iManager to create an NSS volume, then go to *YaST > Open Enterprise Server > Install and Configure Open Enterprise Services* and select iFolder 3.6 to enter new information. All previous configuration information is removed and replaced. See "Installing and Configuring iFolder Services" in the *Novell iFolder 3.8 Administration Guide*.
Novell iManager 2.7.2	See "Installing iManager" in the *Novell iManager 2.7 Installation Guide*.
Novell iPrint	See "Installing and Setting Up iPrint on Your Server" in the *OES 2 SP2: iPrint for Linux Administration Guide*.
Novell Linux User Management	See "Setting Up Linux User Management" in the *OES 2 SP2: Novell Linux User Management Technology Guide*.
Novell NCP™ Server	See "Installing and Configuring NCP Server for Linux" in the *OES 2 SP2: NCP Server for Linux Administration Guide*.

OES 2 SP2 Service	For Additional Installation and Configuration Information
Novell NetStorage	See "Installing NetStorage" in the *OES 2 SP2: NetStorage for Linux Administration Guide*.
Novell QuickFinder™	See "Installing QuickFinder Server" in the *OES 2: Novell QuickFinder Server 5.0 Administration Guide*.
Novell Remote Manager	See "Changing the Configuration" in the *OES 2 SP2: Novell Remote Manager for Linux Administration Guide*.
Novell Samba	See "Installing the Novell Samba Components" in the *OES2 SP2: Samba Administration Guide*.
Novell Storage Services™	See "Installing and Configuring Novell Storage Services" in the *OES 2 SP2: NSS File System Administration Guide*.
Pre-Migration Server	See "Preparing for Transfer ID" in the *OES 2 SP2: Migration Tool Administration Guide*.

.

6.2 Rebooting the Server after Installing NSS

If you install NSS on an existing OES server, enter `rcnovell-smdrd restart` at the command prompt or reboot the server before performing any backups, restores, or server consolidations on the NSS file system.

6.3 Resolving the Certificate Store Error

After installing OES, you might receive the following error:

```
Warning - Unable to change the group owner of the certificate store to www
```

To resolve this error, run the `chgrp` command on the `/opt/novell/lib/java2/jre/lib/security/cacerts` certificate file using the following command in a command shell:

```
chgrp www /opt/novell/lib/java2/jre/lib/security/cacerts
```

6.4 Restarting Tomcat

If you install iManager after the server has been installed, Tomcat is not running and you must restart it to run iManager.

To restart Tomcat, enter the following command at a commandline prompt.

```
/etc/init.d/tomcat5 restart
```

6.5 Launching and Configuring Firefox

After upgrading from OES 2 to OES 2 SP2, you need to launch and configure Mozilla* Firefox* before accessing other applications via a URL.

For example, you cannot configure the Novell Customer Center from the YaST until Firefox is configured.

To configure Firefox,

1. On the GNOME desktop, click *Computer* > *Firefox*.

   or

   On the KDE desktop, click the *Main Menu* icon > *Browse* > *Web Browser* > *Firefox*.
2. Configure the browser.

Updating (Patching) an OES 2 SP2 Server

7

Updating an Novell® Open Enterprise Server (OES) 2 Linux server is essentially the same as updating a SUSE® Linux Enterprise Server (SLES) 10 SP3 server except that you apply patches for both SLES 10 SP3 and OES 2 SP2.

To update your server with the patches released from Novell requires you to perform the following tasks during the installation or upgrade or after the installation or upgrade is complete. The instructions in this section are for patching the server after the installation or upgrade is complete.

7.1 Overview of Updating (Patching)

7.1.1 The Patch Process Briefly Explained

The OES 2 patch process consists of the following processes:

1. The patch tool (rug, Software Updater, or YaST Online Update [YOU]) checks for available patches on its configured patch channels and displays them for selection.
2. The patch administrator selects which patches to apply.
3. The patch tool checks cross-dependencies and displays any messages regarding situations or conflicts that require administrator input.
4. The patches are downloaded.

   If any downloading patches contain information or instructions, these are displayed for administrator acknowledgement. For example, administrators might be instructed to restart a service or run a configuration script file to complete the process after the patch process completes.
5. After all of the messages have been acknowledged, the downloaded patches are installed.
6. If the kernel was updated, the administrator is prompted to restart the server.

7.1.2 Update Options

OES 2 administrators have three options for updating servers with patches from Novell.

- **ZENworks Linux Management (ZLM):** Is an enterprise level product that requires a separate license. It provides updates for SUSE Linux Enterprise, OES, and Red Hat* Enterprise Linux (RHEL) products. In addition to hosting updates for download it is also capable of pushing them to targeted devices through a single Web interface. For more information about ZLM see the ZLM Product Page on Novell.com (http://www.novell.com/products/zenworks/linuxmanagement/).
- **Subscription Management Tool (SMT) for SUSE Linux Enterprise:** This product doesn't require a separate license. It lets you host patches from the Novell online update channel on an internal server, providing more security and greatly reducing Web traffic related to server updates. SMT is available for download on the Novell Download Site (http://download.novell.com/Download?buildid=5YxjWD8_ZZk~).
- **Novell Online Update Servers:** For those who don't require an internal update source, OES 2 servers can be easily configured to access the online patch channel directly. Instructions for doing this are included in the sections that follow.

7.2 Preparing the Server for Updating

1. Make sure you have installed all the services that you need on the server.
2. Before starting your update, make note of the root partition and available space.

   If you suspect you are running short of disk space, secure your data before updating and repartition your system. There is no general rule of thumb regarding how much space each partition should have. Space requirements depend on your particular partitioning profile and the software selected.

   The `df` -h command lists the device name of the root partition. In the following example, the root partition to write down is /dev/`hda2` (mounted as `/`).

   Example: List with df -h.

   ```
   ti:~ # df -h
   Filesystem            Size  Used Avail Use% Mounted on
   /dev/hdb2             186G  2.9G  183G   2% /
   udev                  506M  204K  506M   1% /dev
   ti:~ #
   ```

   In particular, ensure that you have enough space where the update process downloads all the updates to in `/var/cache/zmd/`.

   Depending on the number of patches that you are going to apply, you might need about 3 GB for OES 2 SP2.
3. Before updating the server, secure the current data on the server.

   Copy all configuration files to a separate medium, such as a streamer, removable hard disk, USB stick, or ZIP drive, to secure the data. This primarily applies to files stored in `/etc` as well as some of the directories and files in `/var` and `/opt`. You might also want to write the user data in `/home` (the HOME directories) to a backup medium. Back up this data as `root`. Only `root` has read permission for all local files.

7.3 Registering the Server in the Novell Customer Center

Before you can patch an OES 2 SP2 server with updates from Novell, you must register the server either during installation or later by using the instructions in this section.

If you register using evaluation codes, your server can receive patches for only 60 days, at which point the codes expire. You need to register each server with the Novell Customer Center only once. After you have registered the server, you can update the server at any time. This includes replacing evaluation codes with purchased codes. You can use the desktop interface (GUI) or command line commands to accomplish this task.

This section contains the following information:

7.3.1 Prerequisites

To complete these procedures, you must have the following:

- A Novell Customer Center (NCC) account or access to an account.

  For more information about creating a Novell Customer Center account, see "Creating an Account" in the *Novell Customer Center User Guide* (http://www.novell.com/documentation/ncc/ncc/data/b5exp8k.html#b5exj2f). (This is the same account that you use for Bugzilla.)
- The activation codes for SLES and OES 2 SP2 that you received when you purchased your product.
- An installation source that contains the update patches.

  An installation source is automatically added to the server when you register with the Novell Customer Center or you can add a different source manually.
- An established connection to the Internet.

7.3.2 Registering the Server in the Novell Customer Center (Command Line)

Do the following to register a new server or to replace evaluation activation codes with standard codes.

1. Log in to the server as `root` or su to `root`
2. At the command line, enter

   ```
   suse_register -a email=email_address -a regcode-sles=SLES_registration_code -a regcode-oes=oes2_registration_code
   ```

   For example,

   ```
   suse_register -a email=joe@example.com -a regcode-sles=4adab769abc68 -a regcode-oes=30a74ebb94fa
   ```

IMPORTANT: If you are replacing evaluation codes with purchased codes, simply enter the codes. No further action is required.

3 Verify that the server is registered by seeing whether you have the service types and catalogs needed for updates.

3a To verify the service type, enter

```
rug sl
```

The results should be similar to the following:

```
linux:~ # rug sl

# | Status | Type | Name                                  | URI
--+--------+------+---------------------------------------+----------------------
1 | Active | ZYPP | SUSE Linux Enterprise Server 10 SP1 | http://192.65.48.6...
2 | Active | ZYPP | Novell Open Enterprise Server 2     | ftp://192.65.44.13...
3 | Active | NU   | https://nu.novell.com               | https://nu.novell.com

linux:~ #
```

The URIs you see for the ZYPP type will differ based on your installation source.

3b To verify the catalogs, enter

```
rug ca
```

The results should be similar to the following:

```
Sub'd? | Name                                  | Service
-------+---------------------------------------+---------------------------------------
Yes    | SUSE Linux Enterprise Server 10 SP1 | SUSE Linux Enterprise Server 10 SP1
Yes    | Novell Open Enterprise Server 2     | Novell Open Enterprise Server 2
Yes    | SLES10-SP1-Updates                  | https://nu.novell.com
       | SLE10-SP1-Debuginfo-Updates         | https://nu.novell.com
Yes    | OES2-Updates                        | https://nu.novell.com
```

7.3.3 Registering the Server in the Novell Customer Center (GUI)

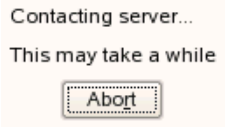
1 In the *YaST Control Center*, click *Software > Novell Customer Center Configuration*.

2 On the Novell Customer Center Configuration configuration page, select all of the following options, then click *Next*.

Option	What it Does
Configure Now	Proceeds with registering this server and the OES product with the Novell Customer Center.
Hardware Profile	Sends the information to the Novell Customer Center about the hardware that you are installing SLES 10 SP1 and OES 2 on.
Optional Information	Sends optional information to the Novell Customer Center for your registration. For this release, this option doesn't send any additional information.
Registration Code	Makes the registration with activation codes mandatory.

Option	What it Does
Regularly Synchronize with the Customer Center	Keeps the installation sources for this server valid. It does not remove any installation sources that were manually added.

After you click *Next*, the following message is displayed. Wait until this message disappears and the Manual Interaction Required page displays.

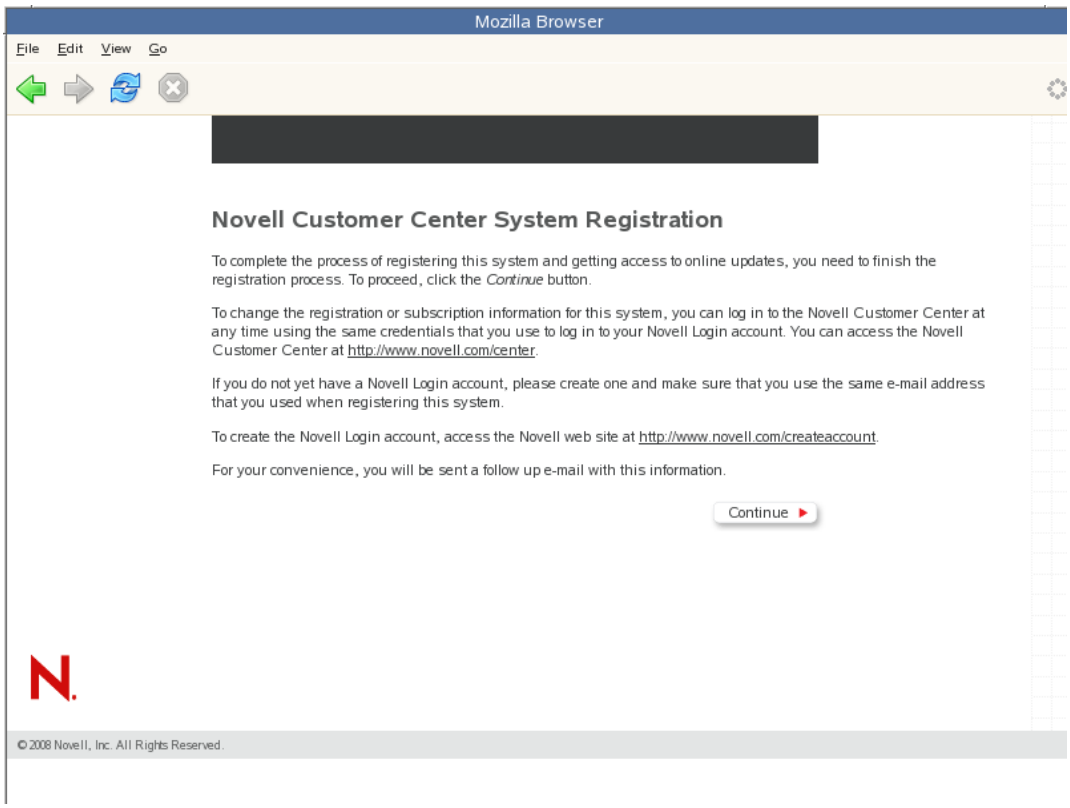


3 On the Manual Interaction Required page, note the information that you will be required to specify, then click *Continue*.

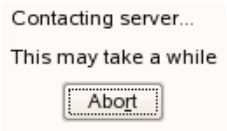
4 On the Novell Customer Center Registration page, specify the required information in the following fields, then click *Submit*:

Field	Information to Specify
Email Address	The e-mail address for your Novell Login account.
Confirm Email Address	The same e-mail address for your Novell Login account
Activation Code for SLES Components (optional)	Specify your purchased or 60-day evaluation registration code for the SLES SP1 product. If you don't specify a code, the server cannot receive any updates or patches.
Activation Code for OES Components (optional)	Specify your purchased or 60-day evaluation registration code for the OES product. If you don't specify a code, the server cannot receive any updates or patches.
System Name or Description (optional)	The hostname for the system is specified by default. If you want to change this to a description for the Novell Customer Center, specify a description to identify this server.

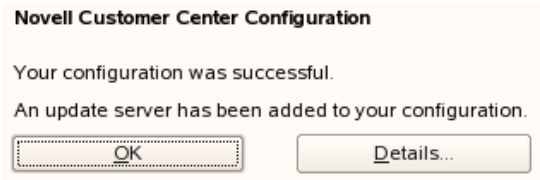
5 When the message to complete the registration displays, click *Continue*.



After you click *Continue*, the following message is displayed with the Manual Interaction Required page. Wait until this message disappears and the Novell Customer Center Configuration Was Successful page displays.



6 When you see the message that the Novell Customer Center was successful, click *OK*.



When the registration is successful, the server is registered in the Novell Customer Center and the installation sources for patches are configured on the server.

7.4 Updating the Server

After the server has been registered in the Novell Customer Center, you can apply updates via packages and patches. The default GNOME desktop indicates when there are updates available to the server. You can update the server from any of the following interfaces.

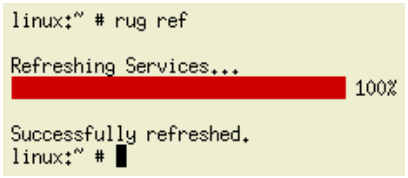
- Section 7.4.1, “Updating the Server by Using the Command Line,” on page 155
- Section 7.4.2, “Updating the Server from the GNOME or KDE Desktop,” on page 160

7.4.1 Updating the Server by Using the Command Line

After you have registered the server in the Novell Customer Center, you can update the server by using commands at the command line. The following procedure specifies steps for updating the server with all available patches for SLES 10 SP3 and OES 2 SP2.

1. Log in to the server as `root` or `su` to `root`.
2. At the command line, enter the following commands:

   2a Refresh all services:

Command	Example Results
`rug ref`	

   2b See whether updates are available for SLES 10 SP3 and OES 2 SP2:

Command	Example Results

`rug lu catolog1 catalog2`
 	
For example,
 	
`rug lu SLES10-SP3-Updates OES2-SP2-Updates`
	No updates are available:
	
	`linux:~ # rug lu SLES10-SP1-Updates OES2-Updates`
	`No updates are available in the specified catalogs.`
	`linux:~ #`
	
	Updates available:
	
	S | Catalog | Bundle | Name | Version | Arch
	v | SLES10-SP1-Updates | | aaa_base | 10-12.31 | i586
	v | OES2-Updates | | adminfs | 1.0.73-3 | i586
	v | SLES10-SP1-Updates | | bind | 9.3.4-1.16 | i586
	v | SLES10-SP1-Updates | | bind-libs | 9.3.4-1.16 | i586
	v | SLES10-SP1-Updates | | bind-utils | 9.3.4-1.16 | i586
	v | OES2-Updates | | CASA | 1.7.1408-4 | i586
	v | SLES10-SP1-Updates | | cifs-mount | 3.0.24-2.28 | i586
	v | SLES10-SP1-Updates | | cpio | 2.6-19.17 | i586
	v | SLES10-SP1-Updates | | cron | 4.1-45.18 | i586
	v | SLES10-SP1-Updates | | cups | 1.1.23-40.24 | i586
	v | SLES10-SP1-Updates | | cups-client | 1.1.23-40.24 | i586
	v | SLES10-SP1-Updates | | cups-libs | 1.1.23-40.24 | i586
	v | SLES10-SP1-Updates | | dhcp-server | 3.0.3-23.38 | i586
	v | SLES10-SP1-Updates | | e2fsprogs | 1.38-25.24 | i586
	v | SLES10-SP1-Updates | | evms | 2.5.5-24.49 | i586
	v | SLES10-SP1-Updates | | evms-gui | 2.5.5-24.49 | i586
	v | SLES10-SP1-Updates | | evolution-data-server | 1.6.0-43.58 | i586
	v | OES2-Updates | | yast2-novell-ncpserver | 2.13.3-35 | noarch
	v | OES2-Updates | | yast2-novell-ncs | 2.13.1-41 | noarch
	v | OES2-Updates | | yast2-novell-netstorage | 2.13.4-32 | noarch
	v | OES2-Updates | | yast2-novell-nss | 2.13.7-43 | noarch
	v | OES2-Updates | | yast2-novell-quickfinder | 2.13.3-34 | noarch
	v | OES2-Updates | | yast2-novell-responsefile | 2.13.1-25 | noarch
	v | OES2-Updates | | yast2-novell-samba | 2.13.3-36 | noarch
	v | OES2-Updates | | yast2-novell-schematool | 2.13.1-32 | noarch
	v | OES2-Updates | | yast2-novell-sms | 2.13.2-29 | noarch
	v | OES2-Updates | | yast2-oes-ldap | 2.13.4-29 | noarch
	v | SLES10-SP1-Updates | | yast2-online-update | 2.13.61-0.2 | noarch
	
	`linux:~ #`

2c Update the server with all available SLES10 SP2 and OES 2 SP2 patches:

Command	Results

`rug up -t patch SLES10-SP3-Updates OES2-SP2-Updates`	`linux:~ # rug up -t patch SLES10-SP1-Updates OES2-Updates`
	`Resolving Dependencies...`
	
	`The following packages will be installed:`
	`adminfs 1.0.73-3 (OES2-Updates)`
	`adminfs-1.0.73-3.i586[OES2-Updates] needed by atom:adminfs-1.0.73-3.i586[OES2-Updates]`
	
	`CASA 1.7.1408-4 (OES2-Updates)`
	`CASA-1.7.1408-4.i586[OES2-Updates] needed by atom:CASA-1.7.1408-4.i586[OES2-Updates]`
	
	`CASA-cli 1.7.1408-4 (OES2-Updates)`
	`CASA-cli-1.7.1408-4.i586[OES2-Updates] needed by novell-oes-dhcp-conf-1.0.0-39.i586[OES2-Updates]`
	
	`google-perftools 0.8-8 (OES2-Updates)`
	`google-perftools-0.8-8.i586[OES2-Updates] needed by atom:google-perftools-0.8-8.i586[OES2-Updates]`
	
	`yast2-oes-trans-zh_CN 2.13.0-11 (OES2-Updates)`
	`yast2-oes-trans-zh_CN-2.13.0-11.noarch[OES2-Updates] needed by atom:yast2-oes-trans-zh_CN-2.13.0-11.noarch[OES2-Updates]`
	
	`yast2-oes-trans-zh_TW 2.13.0-11 (OES2-Updates)`
	`yast2-oes-trans-zh_TW-2.13.0-11.noarch[OES2-Updates] needed by atom:yast2-oes-trans-zh_TW-2.13.0-11.noarch[OES2-Updates]`
	
	`yast2-online-update 2.13.61-0.2 (SLES10-SP1-Updates)`
	`yast2-online-update-2.13.61-0.2.noarch[SLES10-SP1-Updates] needed by atom:yast2-online-update-2.13.61-0.2.noarch[SLES10-SP1-Updates]`
	
	`Proceed with transaction? (y/N) y`
	
	`Downloading Packages...`
	`100%`
	
	`Transaction...`
	`100%`
	
	`Transaction Finished`
	`linux:~ #`

2d Repeat Step 2b and Step 2c until no more updates are available.

Command	Example Results

`rug lu SLES10-SP3-Updates OES2-SP2-Updates`	No updates are available in the specified catalogs:
	`linux:~ # rug lu SLES10-SP1-Updates OES2-Updates`
	`No updates are available in the specified catalogs.`
	`linux:~ #`

2e To finish the update, reboot the server.

Rebooting the server activates the new kernel if it has been updated and ensures that OES services that need restarting after patching are restarted.

You can also update your server with specific maintenance patches by using commands at the command line:

1. Log into the server as `root` or `su` to `root`.
2. At the command line, enter the following commands:

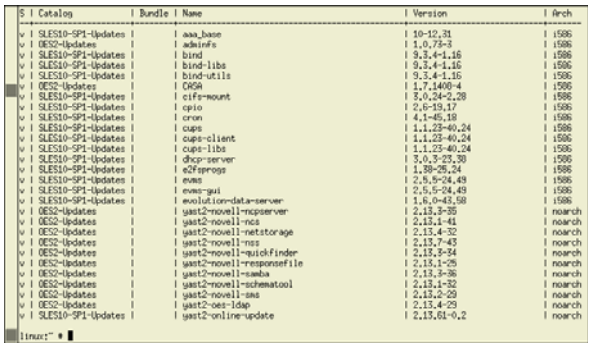
2a Refresh all services

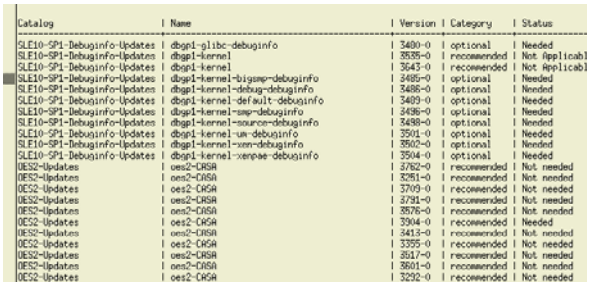
Command	Example Results

rug ref	`linux:~ # rug ref`
	`Refreshing Services...`
	100%
	`Successfully refreshed.`
	`linux:~ #`

2b See whether updates are available, see a list of patches and their status, or see information for a specific patch:

Command	Results

See whether patches are available:
`rug lu catalog1 catalog2`
	No updates are available in the specified catalogs.
	`linux:~ # rug lu SLES10-SP1-Updates OES2-Updates`
	`No updates are available in the specified catalogs.`
	`linux:~ #`
	
	Updates available:
	 

Command	Results
See a list of patches from all catalogs and their status: `rug pch`	

See a list of all installed patches:
 	
`rug pch -i`
	Before patches are installed:
	
	`linux:~ # rug pch -i`
	`No patches found.`
	`linux:~ #`
	
	After two patches are installed:
	
	`linux:~ # rug pch -i`
	
	`Catalog | Name | Version | Category | Status`
	`System | oes2-oes-SPident | 4230-0 | recommended | Applied`
	`System | slesp1-timezone | 4228-0 | recommended | Applied`
	
	`linux:~ #`
	
	After all patches have been installed:
	
	`linux:~ # rug pch -i`
	
	`Catalog | Name | Version | Category | Status`
	`System | oes2-adminfs | 4204-0 | recommended | Applied`
	`System | oes2-CASA | 4201-0 | recommended | Applied`
	`System | oes2-google-perftools | 4214-0 | recommended | Applied`
	`System | oes2-ifolder3-clients | 4202-0 | recommended | Applied`
	`System | oes2-java-1_5_0-ibm-unrestricted-security-policies | 4222-0 | recommended | Applied`
	`System | oes2-libsmbMgmt | 4220-0 | recommended | Applied`
	`System | oes2-nici | 4203-0 | recommended | Applied`
	`System | oes2-novell-bind | 4205-0 | recommended | Applied`
	`System | oes2-novell-cluster-services | 4206-0 | recommended | Applied`
	`System | oes2-novell-evms-plugins | 4217-0 | recommended | Applied`
	`System | oes2-novell-filesystem | 4207-0 | recommended | Applied`
	`System | oes2-novell-iprint-client | 4209-0 | recommended | Applied`
	`System | oes2-novell-iprint-migration | 4212-0 | recommended | Applied`
	`System | oes2-novell-kerberos-admin-server | 4210-0 | recommended | Applied`
	`System | oes2-novell-libncputil | 4213-0 | recommended | Applied`
	`System | oes2-novell-lum | 4211-0 | recommended | Applied`
	`System | oes2-novell-lum-providers | 4216-0 | recommended | Applied`
	`System | oes2-novell-netstorage | 4215-0 | recommended | Applied`
	`System | oes2-novell-NLDAPbase | 4208-0 | recommended | Applied`
	`System | oes2-novell-oes-dhcp-conf | 4218-0 | recommended | Applied`
	`System | oes2-novell-pure-ftpd-config | 4219-0 | recommended | Applied`
	`System | oes2-novell-sms | 4221-0 | recommended | Applied`
	`System | oes2-novell-welcomepage | 4223-0 | recommended | Applied`
	`System | oes2-oes-SPident | 4230-0 | recommended | Applied`
	`System | oes2-quickfinder-engine | 4225-0 | recommended | Applied`
	`System | oes2-release-notes-oes | 4226-0 | recommended | Applied`
	`System | oes2-yast2-oes-trans-cs | 4227-0 | recommended | Applied`
	`System | slesp1-perl-Bootloader | 3680-0 | recommended | Applied`
	`System | slesp1-timezone | 4228-0 | recommended | Applied`
	`System | slesp1-yast2-installation | 3830-0 | recommended | Applied`
	`System | slesp1-yast2-online-update | 3934-0 | recommended | Applied`
	
	`linux:~ #`

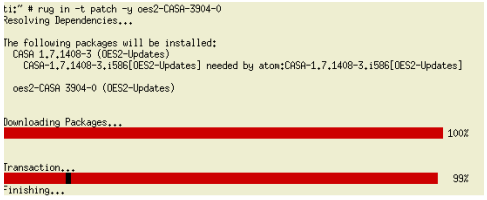
Command	Results

See information for a specific patch:
 	
`rug patch-info patch_name`
 	
For example:
 	
`rug patch-info oes2-oes-SPident`
	`linux:~ # rug patch-info oes2-oes-SPident`
	`Name: oes2-oes-SPident`
	`Version: 3628-0`
	`Arch: noarch`
	`Status: Satisfied`
	`Category: recommended`
	`Created On: 06/08/2007 11:30:26`
	`Reboot Required: No`
	`Restart Required: No`
	`Interactive: No`
	`Summary: Recommended update for oes-SPident for Beta3.27`
	`Description: OES2 Update for oes-SPident for Beta3.27`
	`Provides:`
	`patch: oes2-oes-SPident = 3628-0`
	
	`Requires:`
	`atom: oes-SPident = 1.0.1-4`
	
	`linux:~ #`

2c Update the server with specific patches:

Command	Results

Install all patches from the one or more catalogs of a particular category.
 	
`rug up -t patch catalog1 catalog2 -g category_name`
 	
- security
- recommended
- optional
 	
For example:
 	
`rug up -t patch SLES10-SP3-Updates OES2-SP2-Updates -g security`
	

Install one version of a patch without confirmation:
 	
`rug in -t patch -y patchname-version`
 	
For example:
 	
`rug in -t patch -y oes2-CASA-3904-0`
	

Install all versions of a patch with confirmation:
 	
`rug in -t patch patch_name*`
 	
For example:
 	
`rug in -t patch oes2-oes-SPident*`
	

3 To finish the update, reboot the server.

Rebooting the server activates the new kernel if it has been updated and ensures that OES services that need restarting after patching are restarted.

The following table shows some additional commands you might want to use:

Table 7-1 *Additional Rug Commands*

Task	Command
Halts the ZLM daemon. Accepts the following option flags: ◆ -f, --force: Force the shutdown. ◆ -n, --no-wait: Don't wait for confirmation that the daemon was shut down.	`rug shutdown [options]`
Restarts the ZLM daemon. Accepts the following option flags: ◆ -f, --force: Forc ◆ -n, --no-wait: Does not wait for confirmation that the daemon has restarted. ◆ --clean: Cleans up at restart	`rug restart [options]`
Access help for all the rug commands	`rug`
Access the rug man page	`man rug`

7.4.2 Updating the Server from the GNOME or KDE Desktop

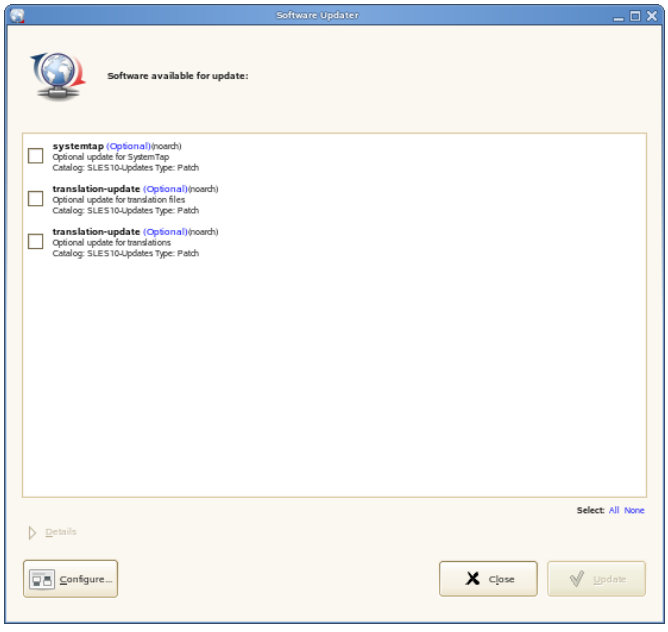
1. Log into the server as `root` or `su` to `root`.
2. Click the *Novell Updater* icon that indicates that updates are available

   On the GNOME Desktop, the icon is on the taskbar.

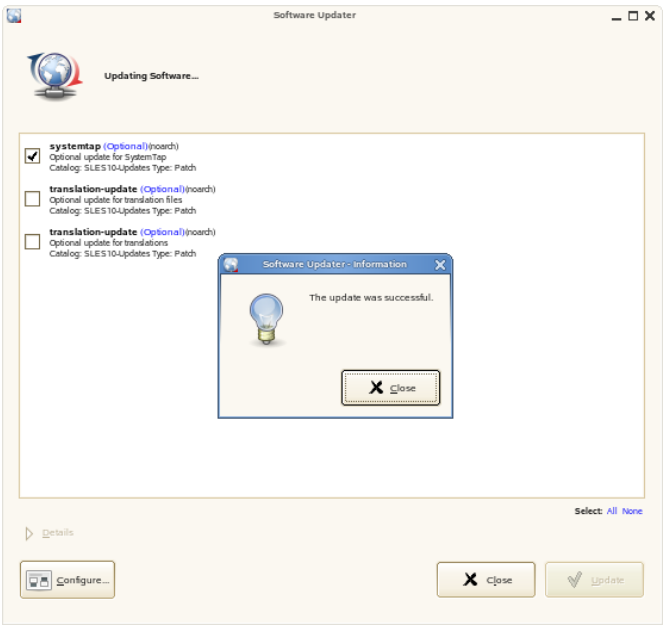
   On the KDE Desktop, click *G* > *System* > *Novell Updater* icon

   If no updates are available, the Novell Updater icon changes appearance to a globe.
3. On the Software Available for Updates page, select the updates that you want to install, then click *Update*.

   Updates that have a Security or Recommended status are usually preselected.



4 When the Software Updater Information status indicates that the update was successful, click *Close*.



5 If necessary, rerun the updater until all the desired patches have been installed.

6 To finish the update, reboot the server.

Rebooting the server activates the new kernel if it has been updated and ensures that OES services that need restarting after patching are restarted.

7.5 Verifying That Your Channel Subscriptions Are Up to Date

When an OES 2 server is updated properly, the update channel list is refreshed to include Updates entries for your OES 2 and SLES 10 versions.

To verify that you have updates from both update channels, do the following:

1 At a terminal prompt on the server you have updated, type the following command:

```
rug ca
```

The list of channels should include Updates channels for your OES 2 and SLES 10 versions. For example, after updating an OES 2 SP2 server, the channel listing should include both `SLES10-SP3-Updates` and `OES2-SP2-Updates` as subscribed channels.

2 If the channel listing on your server doesn't include the updates channels for your OES 2 and SLES 10 versions, follow the instructions in TID 3150078 (http://www.novell.com/support/php/search.do?cmd=displayKC&docType=kc&externalId=3150078&sliceId=2&docTypeID=DT_TID_1_1&dialogID=76715112&stateId=0%200%2076711680) to resolve the issues.

3 After the channel list contains the correct entries, update your server by repeating the pertinent instructions in Section 7.4, "Updating the Server," on page 155.

7.6 Frequently Asked Questions about Updating

This section contains the following information:

7.6.1 Do I apply all the patches in the catalogs or how do I know which patches to apply?

In OES 1, we recommended that all the patches in the channel be applied. However, in OES 2 the dependency checking has been improved to help you understand more about each patch listed in the catalogs.

Each patch has a category and a status associated with it. The categories state whether the patch is a security patch, a recommended patch, or an optional patch. The `rug pch` command shows whether the patch is needed or not needed and whether it has been applied. When you are using the Novell Updater, only the patches that are needed and have not been applied display in the list of patches.

Therefore, you can just apply all the security patches and wait to apply other patches that might change how a feature or product works.

7.6.2 How do I re-add the catalogs for OES 2 in my ZENworks Management Daemon (ZMD) configuration after removing one or more of them?

To re-add the catalogs and services needed for updating your version of OES 2 to the ZMD configuration:

1. Delete the `/var/cache/SuseRegister/lastzmdconfig.cache` file.

   ```
   rm /var/cache/SuseRegister/lastzmdconfig.cache
   ```

2. At the command line, enter

   ```
   suse_register -a email=email_address -a regcode-
   sles=SLES_registration_code -a regcode-oes=oes2_registration_code
   ```

   For example,

   ```
   suse_register -a email=joe@example.com -a regcode-sles=4adab769abc68 -a
   regcode-oes=30a74ebb94fa
   ```

   Performing this procedure removes the complete ZMD configuration, then registers the server in the Novell Customer Center again. When you register the server in the Novell Customer Center again, it adds all the catalogs and services that are need for updating your version of OES 2.

7.6.3 What about YaST Online Update?

Novell supports two mechanisms for updating an OES 2 server:

- The rug utility from a terminal prompt.
- The Novell Updater from a GUI desktop.

However, some OES administrators prefer to use YaST Online Update (YOU) for updating OES 2 servers. Although YOU is not tested by OES 2 product testers, the only customer problems reported to Novell occur when someone tries to use both the rug-based methods and the YOU method in combination on the same server.

IMPORTANT: Whichever method (YOU or rug-based) you choose for a given OES2 SP1 server, that method must be used exclusively for the life of the server.

For more information about using YOU to update your servers, see "YaST Online Update" (http://www.novell.com/documentation/sles10/sles_admin/data/sec_yast2_sw.html#sec_yast2_sysconfig_onupdate) in the *SLES 10 Administration Guide*.

7.7 Patching From Behind a Proxy Server

See TID 3132246 (http://www.novell.com/support/viewContent.do?externalId=3132246&sliceId=2).

7.8 Quick Path Updating

This section contains the following Quick Path steps for patching an OES 2 server:

- Section 7.8.1, "Do Not Use rug up without the -t Option," on page 163
- Section 7.8.2, "Command Line Quick Path for Updating OES 2," on page 163
- Section 7.8.3, "GUI Quick Path for Updating OES 2 SP2," on page 166

7.8.1 Do Not Use rug up without the -t Option

Do not use the `rug up` command by itself to update an OES server. Always use the `-t patch` option as described in Section 7.8.2, "Command Line Quick Path for Updating OES 2," on page 163.

If the `-t patch` option is omitted, rug includes SLES packages in the download that can cripple or completely break OES services.

The `-t patch` option also ensures that patch meta data (including script files, etc.) is downloaded so that SLES can correctly update the system.

7.8.2 Command Line Quick Path for Updating OES 2

1 Make sure you have the following:

- A Novell Customer Center account

  If you don't have one, create it at http://www.novell.com/register. This is the same account that you use for Bugzilla.

- Activation Codes for both SLES 10 and OES 2
- A valid installation source
- An established connection to the Internet
- All of the services installed that you need on the server.
- Enough disk space in `/var/cache/zmd/` where the update process downloads all the updates to.

  Depending on the number of patches that you are going to apply, you might need about 3 GB.
- A backup of the current data on the server.

2 Register the server in the Novell Customer Center (one time only).

2a Log in to the server as `root` or su to `root`.

2b At the command line, enter

```
suse_register -a email=email_address -a regcode-
sles=SLES_registration_code -a regcode-oes=oes2_registration_code
```

For example,

```
suse_register -a email=joe@example.com -a regcode-sles=4adab769abc68 -
a regcode-oes=30a74ebb94fa
```

2c Verify that the server is registered by seeing whether you have the service types and catalogs needed for updates.

To verify the service types, enter

```
rug sl
```

To verify that you have the catalogs you need, enter

```
rug ca
```

3 Update the server with all available updates:

3a Refresh all services by entering:

```
rug ref
```

3b See whether updates are available by entering:

```
rug lu SLES10-SP3-Updates OES2-SP2-Updates
```

3c Update the server with all available SLES10-SP3 and OES 2 SP2 patches by entering:

```
rug up -t patch SLES10-SP3-Updates OES2-SP2-Updates
```

3d Repeat Step 3b and Step 3c until there are no more SLES10-SP3 or OES 2 SP2 patches.

When there are no more patches, continue with Step 3e.

3e Reboot the server to finish the update.

Rebooting the server activates the new kernel and ensures that OES services that need restarting after patching are restarted.

You can also update your server with specific maintenance patches.

1 Log into the server as `root` or `su` to `root`.

2 At the command line, enter the following commands:

2a To refresh all services, enter

```
rug ref
```

2b To check for available updates, enter

```
rug lu SLES10-SP3-Updates OES2-SP2-Updates
```

2c To list the patches and their status, enter

```
rug pch SLES10-SP3-Updates OES2-SP2-Updates
```

2d To view specific patch information, enter

```
rug patch-info patch_name
```

For example:

```
rug patch-info slesp1-xpdf
```

2e To list all installed patches, enter

```
rug pch -i
```

2f To update the server with specific patches, choose from the following:

- To install all patches from one or more catalogs of a particular category.

  ```
  rug up -t patch catalog1 catalog2 -g category_name
  ```

  Replace *category_name* with: security, recommended, or optional.

  For example,

  ```
  rug up -t patch SLES10-SP3-Updates OES2-SP2-Updates -g security
  ```

- To install one version of a patch without confirmation, enter:

  ```
  rug in -t patch -y patch_name-version
  ```

  For example:

  ```
  rug in -t patch -y oes2-CASA-3904-0
  ```

- To install all versions of a patch, enter:

  ```
  rug in -t patch patch_name*
  ```

  For example:

  ```
  rug in -t patch oes2-oes-SPident*
  ```

2g Reboot the server to ensure that any changes to the kernel are activated, and applicable OES 2 services are restarted.

The following table shows some additional commands you might want to use:

Table 7-2 *Additional Rug Commands*

Task	Command
Halts the ZLM daemon. Accepts the following option flags: • -f, --force: Force the shutdown. • -n, --no-wait: Don't wait for confirmation that the daemon was shut down.	`rug shutdown [options]`

Task	Command
Restarts the ZLM daemon. Accepts the following option flags: • -f, --force: Forces the shutdown. • -n, --no-wait: Does not wait for confirmation that the daemon has restarted. • --clean: Cleans up at restart	`rug restart [options]`
Access help for all the rug commands	`rug`
Access the rug man page	`man rug`

7.8.3 GUI Quick Path for Updating OES 2 SP2

To update your server with the patches released from Novell after the server has been installed and configured:

1 Make sure you have the following:

- A Novell Customer Center account (If you don't have one, create it at http://www.novell.com/register. This is the same account that you use for Bugzilla.)
- Activation Code for SLES 10 and OES 2 SP2
- A valid installation source
- An established connection to the Internet
- Make sure you have installed all the services that you need on the server.
- Before starting your update, make note of the root partition and space available.

  In particular, ensure you have enough space where the update process downloads all the updates to in /var/cache/zmd/. Depending on the amount of patches that you are going to upgrade, you might need about 3 GB.
- Before updating the server, secure the current data on the server.

2 Register the server in the Novell Customer Center.

If the server is already registered in the Novell Customer Center, skip to Step 3.

2a In the *YaST Control Center*, click *Software* > *Novell Customer Center Configuration*.

2b On the Novell Customer Center Configuration configuration page, select all of the following options, then click *Next*.

- Configure Now
- Hardware Profile
- Optional Information
- Registration Code
- Regularly Synchronize with the Customer Center

After you click *Next*, a Contacting Server message is displayed. Wait until this message disappears and the Manual Interaction Required page displays.

2c On the Manual Interaction Required page, note the information that you will be required to specify, then click *Continue*.

2d On the Novell Customer Center Registration page, specify the required information in each field, then click *Submit*:

2e When the message to complete the registration displays, click *Continue*. After clicking *Continue*, the Contacting Server message is displayed with the Manual Interaction Required message. Wait until this message disappears and Novell Customer Center Configuration Was Successful page displays.

2f When you see the message that the Novell Customer Center was successful, click *OK*.

2g Confirm that you get the registration e-mails from the Novell Customer Center. You can perform Step 3 before you receive these e-mails.

3 Update the server from GNOME Desktop or KDE desktop:

3a Log into the server as `root`.

3b Click the Novell Updater icon that indicates that updates are available. If no updates are available, the Novell Updater icon changes appearances to a globe.

3c On the Software Available for Updates patches, select the updates that you want to install, then click, *Update*.

3d When the Software Updater Information status indicates that the update was successful, click *Close*.

3e Repeat Step 3c and Step 3d until all available patches are applied.

3f Reboot the server to finish the update.

Rebooting the server activates the new kernel and ensures that OES services that need restarting after patching are restarted.

Using AutoYaST to Install and Configure Multiple OES Servers

8

If you need to install OES to multiple systems that perform similar tasks and that share the same environment and similar but not necessarily identical hardware, you might want to use AutoYaST to perform the installation.

You use the Configuration Management tool (*YaST > Miscellaneous > Autoinstallation*) to generate an XML profile file (referred to as a control file) and use it to perform OES installations to multiple servers that share the same hardware and environments. You can also tailor this control file for any specific environment. You then provide this control file to the YaST2 installation program.

This section does not provide complete AutoYaST instructions. It provides only the additional information you need when setting up AutoYaST to install multiple OES 2 SP2 servers.

For complete instructions on using AutoYaST2, see *Automatic Linux Installation and Configuration with Yast2* (http://forgeftp.novell.com/yast/doc/SLES10/autoinstall/index.html). You can also access the documentation locally on an OES server in `/usr/share/doc/packages/autoyast2/html/index.html` or `autoyast.pdf`.

This section contains the following information:

8.1 Security Considerations

See Password for User Admin Written in Clear Text in control.xml (page 211).

8.2 Prerequisites

You need at least the following components to install an OES 2 SP2 server using AutoYaST:

- ❑ A server with OES 2 SP2 already installed
- ❑ One or more target computers to install the server software to and the following information about each:
  - Number of hard disks
  - MAC address
  - Monitor types and graphics hardware
- ❑ A control file

  For information on setting up a control file with OES components, see “Setting Up a Control File with OES Components” on page 170.
- ❑ A boot scenario set up

You can boot from media or from an installation source. For more information, see "Setting Up an Installation Source" on page 176.

- ❑ A source or server that contains the AutoYaST profile (control file)

  For more information, see "Setting Up an Installation Source" on page 176.

8.3 Setting Up a Control File with OES Components

The control file is an XML file that contains an installation profile for the target computer. This installation profile contains all the information to complete software installation and configuration on the target computer.

To create a control file:

- You can create the control file manually in a text editor (not recommended).
- When completing an installation, you can click *Clone for AutoYaST*. If you use this option, the resulting file is `/root/autoinst.xml`. This file must be edited manually before using it. See Section 8.3.1, "Fixing an Automatically Created Control File," on page 170.
- You can create or modify a control file by using the AutoInstallation module in YaST. For procedures, see Section 8.3.2, "Using the AutoInstallation Module to Create the Control File," on page 171.

  This system depends on existing modules that are usually used to configure a computer after OES 2 SP2 is installed on a server.

8.3.1 Fixing an Automatically Created Control File

Review the following issues and solutions to fix the automatically created control file.

- **Issue 1:** If you install all OES Services using AutoYaST, Apache does not run.

  Solution: Reboot the server when the installation is complete; or when creating the profile or control file, deselect the Print Server pattern in the Primary Functions category. If you have already created the control file, remove the following section:

  ```
  - <printer>
    <cups_installation config:type="symbol">server< cups_installation>
    <default />
    <printcap config:type="list" />
    <server_hostname />
    <spooler>cups</spooler>
    </printer>
  ```

- **Issue 2:** The Certificate Authorities section of the control file is not created.

  Solution: You must insert the CA section manually.

  To add this information to the control file, do the following:

  1. Open YaST as `root`.
  2. Click *Miscellaneous* > *Autoinstallation*.
  3. Select *Security and Users* > *CA Management*, then click *Configure*.
  4. In the *Common Name File* field, specify a name for the certificate. For example YaST_Default_CA(*hostname*).

5. Specify an e-mail name in the *Email* field.

6. Specify a password in the *Password* field.

7. Click *File Save* to save the file. Ignore any error messages that you receive.

8. Click *View Source* to ensure that the CA entry was entered.

See the following syntax:

```
<ca_mgm>
    <CAName>YaST_Default_CA</CAName>
    <ca_commonName>YaST_Default_CA(hostname)</ca_commonName>
    <country>US</country>
    <importCertificate config:type="boolean">false</importCertificate>
    <locality></locality>
    <organization></organization>
    <organizationUnit></organizationUnit>
    <password>actual_password</password>
    <server_email>name@example.com</server_email>
    <state></state>
    <takeLocalServerName config:type="boolean">true</takeLocalServerName>
  </ca_mgm>
```

- **Issue 3:** If you install Novell Cluster Services™, one package does not install correctly.

  Solution: Comment out the following line in the control file.

  ```
  <package>novell-cluster-services-kmp-smp</package>
  ```

  For example:

  ```
  <!--<package>novell-cluster-services-kmp-smp</package>-->
  ```

Issue 4: If you did not patch the server during the installation, the OES product is not identified correctly in the control file.

Solution: When creating the profile or control file, change the product line from:

```
<product>Novell Open Enterprise Server 2</product>
```

to

```
<product>OPEN_ENTERPRISE_SERVER</product>
```

8.3.2 Using the AutoInstallation Module to Create the Control File

The following procedure contains a quick list of steps to create the control file using the AutoInstallation module in YaST on a server running OES 2.

1. On a server that has OES 2 installed, open the YaST2 Control Center.
2. Click *Miscellaneous* > *Autoinstallation*.
3. Click *Tools* > *Create Reference Control File*.
4. In the Create a Reference Control File dialog box, select the *Network card* check box in the *Select Additional Resources* field, then click *Create*.

   AutoYaST probes the system for software, partitioning, boot loader, network card information, language settings, mouse, and other system settings.

5 Verify the package selections.

5a Click *Software* > *Package Selection*.

5b On the Package Selection page, make sure the items are the same as you previously selected. For more information on the add-ons (software selections) that are selected in the base selections or patterns, see "Deciding What Patterns to Install" on page 28. If the configuration contains the packages and selections you need, skip to Step 7. If not, continue with Step 6.

6 If you need to change the package selections for the target servers, do the following:

6a In the Package Selection dialog box, click *Configure*.

6b On the Software Selection page, click *Patterns* in the *Filter* field.

6c Select the specific software items that you want to be added, then click *Accept*.

6d If you are prompted to accept the AGFA Monotype Corporation End User License Agreement, click Accept.

6e Accept the automatic changes by clicking *Continue* in the Changed Packages dialog box.

7 Specify the Partitioning parameters for the target server:

7a From the Main YaST AutoInstallation menu, click *Hardware* > *Partitioning* > *Configure*.

7b Set up partitioning on the first drive as desired, then click *Finish*.

See the online help for details about limitations.

For more information on partitioning options, see *"Partitioning" in Automatic Linux Installation and Configuration with Yast2* (http://forgeftp.novell.com/yast/doc/SLES10/autoinstall/CreateProfile.Partitioning.html).

8 Specify the settings for the graphics card and monitor:

8a From the Main YaST AutoInstallation menu, click *Hardware* > *Graphics Card and Monitor* > *Configure*.

8b In the *General Options* field of the X11 Configuration page, specify the settings that you want.

8c In the *Desktop* field of the X11 Configuration page, select the settings that you want for the Display Manager and Window Manager, then click Next.

8d On the Configure Monitor page, select the applicable monitor vendor and model, then click *Next*.

8e Verify the X11 settings. If they are not correct, repeat Step 8a and Step 8d.

If you skip this step, the server keyboard mappings might be German.

9 (Optional) Insert a script to perform a task that you might want, such as a script for removing partitions:

For more information on custom user scripts, see "Custom User Scripts" (http://forgeftp.novell.com/yast/doc/SLES10/autoinstall/createprofile.scripts.html)in *Automatic Linux Installation and Configuration with Yast2*.

9a From the Main YaST AutoInstallation menu, click *Miscellaneous* > *Custom Scripts* > *Configure*.

9b On the User Script Management page, click *New*.

9c In the *File Name* field, specify a descriptive name for the script, such as `hello_world_script`.

9d In the *Script Source* field, specify commands such as the following example script:

```
#!/bin/sh
'echo "hello world" > /tmp/post-script-output'
```

9e Click the *Type* drop-down box, then select *Post*.

This script runs after the installation is complete. For additional options, see the online help for this dialog box.

9f Click *Save*.

9g Make sure your script appears in the *Available Scripts* section of the User Script Management page, then click *Finish*.

9h Make sure your script appears in the *Post Scripts* section of the Custom Scripts page.

10 Set the password for the `root` user:

10a From the Main YaST AutoInstallation menu, click *User Management* > *Configure*.

10b Click *Set Filter*, then select *Select System Users* from the drop-down menu.

10c Select user *root*, then click *Edit*.

10d Type a password for the `root` user in the *Password and Verify Password* fields, click *Accept*, then click *Finish*.

10e Verify that the `root` user appears in the *Users* section of the *User Management* dialog box.

11 Set a password for Certificate Authority management:

11a From the *Main YaST AutoInstallation* menu, click *Security and Users* > *CA Management* > *Configure*.

11b Type a password for the certificate in the *Password and Confirm Password* fields, then click *Finish*.

11c Verify that the Password status appears as *Set* on the *CA Management* page.

12 Configure OES Services:

12a From the Main YaST AutoInstallation menu, click *Open Enterprise Server* > *module_name* > *Configure*.

All OES services are in the Open Enterprise Server category.

We recommend configuring eDirectory first. Although there are dependencies for some of the components, in this release AutoYaST does not verify whether one module is configured or not.

See the following table for category names and dependencies. You should configure all the modules that were selected for the software selections in Step 5 on page 172. For more information about which modules are in each pattern, see "Deciding What Patterns to Install" on page 28.

Module Name	Other Module Dependencies
Novell AFP	◆ Novell Backup / Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Storage Services (NSS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)

Module Name	Other Module Dependencies
Novell Archive and Version Services	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory™ ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM) ◆ Novell Storage Services™ (NSS)
Novell Backup/ Storage Management Services (SMS)	◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell CIFS	◆ Novell Backup / Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Storage Services (NSS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell Cluster Services (NCS)	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell DHCP	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell DNS	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell Domain Services for Windows	◆ Novell Backup / Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell DNS ◆ Novell iManager ◆ Novell iPrint ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM) ◆ Novell Storage Services (NSS) ◆ Novell NCP Server
Novell eDirectory	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)

Module Name	Other Module Dependencies
Novell FTP	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell iFolder	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell iManager	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell iPrint	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell iManager ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell Linux User Management (LUM)	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Remote Manager (NRM)
Novell NCP Server / Dynamic Storage Technology	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell NetStorage	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell iManager ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell Pre-Migration Server	◆ Novell Backup / Storage Management Services (SMS) ◆ Novell eDirectory (without a replica) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell QuickFinder	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell Remote Manager (NRM)	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM)

Module Name	Other Module Dependencies
Novell Samba	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)
Novell Storage Services (NSS)	◆ Novell Backup/Storage Management Services (SMS) ◆ Novell eDirectory ◆ Novell NCP Server ◆ Novell Linux User Management (LUM) ◆ Novell Remote Manager (NRM)

12b Type or select the information for each field requested on each page, then click *Next* until a summary of setting is displayed for that service.

12c Verify that the settings for each module are what you want.

If not, click *Reset Configuration* and provide the corrected settings.

12d Repeat Step 12a through Step 12c until all the required modules have been configured, then continue with Step 13.

13 Save the file.

13a Click *File* > *Save*.

13b Browse to a location that you want to save the file to.

13c Type `filename.xml`, then click *Save*.

Replace *filename* with an appropriate name to identify the control file for the installation you are performing.

By default, the file is saved in the `/var/lib/autoinstall/repository/` directory.

For additional filename requirements and recommendations, see "The Auto-Installation Process" in *Automatic Linux Installation and Configuration with Yast2* (http://forgeftp.novell.com/yast/doc/SLES10/autoinstall/Invoking.html).

14 Exit the configuration management tool by clicking *File* > *Exit*.

15 Proceed with "Setting Up an Installation Source" on page 176.

8.4 Setting Up an Installation Source

For OES 2, you must set up a separate directory for the SLES 10 software and the OES 2 software.

AutoYaST requires an installation source. You have several options. For an explanation of each, see "Network Based Installation" (http://forgeftp.novell.com/yast/doc/SLES10/autoinstall/Invoking.html) and "The Auto-Installation Process" in *Automatic Linux Installation and Configuration with Yast2* (http://forgeftp.novell.com/yast/doc/SLES10/autoinstall/Bootmanagement.html).

You can also set up an installation source on a NetWare server. See Appendix C, "Setting Up an Installation Source on NetWare," on page 225.

Installing OES as a Xen VM Host Server

9

You can install Novell® Open Enterprise Server (OES) 2 SP2 Linux as a Xen VM host server.

To understand why you might want your VM host server to have OES 2 SP2 installed, see "Why Install OES Services on Your VM Host?" in the *OES 2 SP2: Planning and Implementation Guide*.

To install OES 2 SP2 on your VM host server, add the following steps to the basic installation instructions found in "Setting Up a Virtual Machine Host" (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/cha_xen_virtualization_vhost_setup.html) in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html) guide.

1. When you reach the Installation Mode page, select the *Include Add-On Products from Separate Media* option and complete the instructions in Section 3.3.3, "Specifying the Add-On Product Installation Information," on page 47.
2. When you reach the Installation Settings page, click the *Software* heading.
3. Of the services listed in the *OES Services* category, only the following are supported on a Xen VM host server:
   - Novell Linux User Management (LUM)
   - Novell Storage Management Services™ (SMS)
   - Novell Cluster Services® (NCS)

   You can select any of these services that you want to be available on the host server, or you can leave all of the services deselected. In either case the server will be configured as an OES server.
4. If you selected any of the supported OES services, you will notice that Novell Remote Manager (NRM) is also selected. Click the green checkmark by NRM to change it to a red taboo symbol and prevent NRM from being installed. NRM is not a supported OES service on a Xen VM host server.
5. In the *Primary Functions* category, select *Xen Virtual Machine Host Server*.

   Because you want the host server optimized to manage your virtual machines, do not choose any additional primary functions. Other services should be installed on an OES or SLES 10 VM guest server or physical server.
6. In the *Primary Functions* category, deselect *Print Server* by clicking the option twice.
7. On the Configured LDAP Servers page, specify the tree name, admin name, and password for the eDirectory tree into which you are installing the host server.

   IMPORTANT: If you didn't select any OES services, the Novell Open Enterprise Server Configuration page appears instead. In that case, the Configured LDAP Servers page is accessible via the *LDAP Configuration for Open Enterprise Services* link.

   ---
8. Click *Add* and specify the IP address of a server in the tree that has eDirectory installed on it, then click *Next*.
9. On the Novell Open Enterprise Server Configuration page, click *Next*.

10 When you reach the User Authentication Method page, do not change the Authentication Method.

11 On the New Local User page, do not create a local user.

12 After the server boots, make sure the GRUB boot loader is set to run the Xen kernel by doing the following:

12a On the desktop, click *Computer* > *YaST*.

12b In YaST click *System* > *Boot Loader*.

12c Make sure there is a check mark by the *XEN* label. If a different option is checked, select *XEN* and click the *Set as Default* button.

12d Click *Finish*.

12e Close YaST and restart the server.

The server is now prepared to function as a Xen VM host server.

Installing, Upgrading, or Updating OES on a Xen-based VM

10

In Novell® Open Enterprise Server (OES) 2 SP2, you can install OES 2 SP2 as a guest operating system on a

- SUSE® Linux Enterprise Server (SLES) 10 Linux server

  See "Setting Up a Virtual Machine Host" (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/cha_xen_virtualization_vhost_setup.html) in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html)guide.

  or

- OES 2 SP2 server that has been set up as a Xen-based host server

  See Chapter 9, "Installing OES as a Xen VM Host Server," on page 177.

For general information on the Xen virtualization technology in SLES 10 SP3, see the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html)guide.

This section documents the system requirements, installation instructions, upgrade and migration instructions, and issues associated with setting up OES 2 on a Xen-based virtual machine.

10.1 System Requirements

To create an OES 2 SP2 VM guest, you need a SLES 10 SP3 or OES 2 SP2 server that is set up as a Xen VM host server.

10.1.1 OES 2 SP2 VM Host Considerations

When setting up a virtual machine host for OES 2 SP2 VM guests, ensure that the host server has the following:

- **Time synchronization:** Set the server's time configuration to the same reliable, external time source as the eDirectory™ tree that the virtual machines on that host will be joining.

  To set the time source, use *Yast > Network Services > NTP Time Configuration*.

  The time source can be running NTP or Timesync.

- **RAM:** Enough memory to support each virtual machine that you want to run concurrently on the host server.

  For example, if you are installing one OES 2 SP2 virtual machine, you need a minimum of 1 GB of memory (512 MB for the host plus 512 MB for the OES 2 Linux VM).

  If you are installing two virtual machines, and the first VM guest's services need 1 GB while the second guest's need 1.5 GB, you need 2.5 GB for the VM guests and 512 MB for the host—a total of 3 GB.

- **Disk Space:** Enough disk space on the host for creating and running your VM guests.

  The default disk space required for an OES 2 SP2 VM guest is 4 GB and the default allocation for each VM guest in Xen is 10 GB, leaving approximately 6 GB for data files, etc. The space you need is dependent on what you plan to use the virtual server for and what other virtual storage devices, such as NSS volumes, that you plan to attach to it.

10.1.2 NSS Considerations

If you want to set up Novell Storage Services (NSS) on the virtual machine, note the following:

- NSS can recognize physical, logical, or virtual devices up to 2 TB in size (where 1 TB = 2E40 bytes = 1,099,511,627,776 bytes).
- In a virtual environment, the devices that you want to use for the NSS file system on the guest operating system cannot exceed the 2 TB limit, even if the host operating system and guest operating system can handle larger devices.

  For information, see "Device Size Limit" in the *OES 2 SP2: NSS File System Administration Guide*.

10.1.3 Setup Instructions

As mentioned in Chapter 10, "Installing, Upgrading, or Updating OES on a Xen-based VM," on page 179, you can use either an SLES 10 SP3 server or an OES 2 SP2 server as your VM host server.

For setup procedures, see

- **SLES 10 SP3:** "Setting Up a Virtual Machine Host" (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/cha_xen_virtualization_vhost_setup.html) in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html) guide.

  or

- **OES 2 SP2:** "Chapter 9, "Installing OES as a Xen VM Host Server," on page 177."

10.2 Prerequisites

Before creating an OES 2 SP2 virtual machine, you need the following:

- If you want to use AutoYaST to specify the Installation settings, create an AutoYaST profile (control) file and download it to a directory on the host machine server or make it available on the network.
- A static IP address for each virtual server that you want to create.

10.3 Preparing the Installation Software

- Section 10.3.1, "Downloading the Installation Software," on page 181
- Section 10.3.2, "Preparing the Installation Source Files," on page 181

10.3.1 Downloading the Installation Software

For information on downloading the following ISO image files, see the Novell Open Enterprise Server 2 Download Instructions (http://www.novell.com/documentation/oes2/esd/di_oes2.html).

Table 10-1 *OES ISO Images and CD Labels for i386 (32-Bit Installations)*

ISO Image File	CD Label
`OES2-SP2-i386-CD1.iso`	*Novell Open Enterprise Server 2 SP2 CD 1*
`SLES-10-SP3-DVD-i386-GM-DVD1.iso`	*SuSE Linux Enterprise Server 10 SP3 DVD*

Table 10-2 *OES ISO Images and CD Labels for x86_64 (64-Bit Installations)*

ISO Image File	CD Label
`OES2-SP2-x86_64-CD1.iso`	*Novell Open Enterprise Server 2 SP2 CD 1*
`SLES-10-SP3-DVD-x86_64-GM-DVD1.iso`	*SuSE Linux Enterprise Server 10 SP3 DVD*

10.3.2 Preparing the Installation Source Files

To create an OES 2 SP2 VM guest, you must make the installation software available in one of the following locations:

- **A Local Installation Source:** The 32-bit (Table 10-1) or 64-bit (Table 10-2) ISO files copied to the host server's local drives.

  or

- **A Network Installation Source:** The 32-bit (Table 10-1) or 64-bit (Table 10-2) ISO files used to create a network installation source. For instructions, see "Setting Up the Server Holding the Installation Sources" in the *SUSE Linux Enterprise Server 10 Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/sec_deployment_remoteinst_instserver.html).

10.4 Installing an OES 2 SP2 VM Guest

Creating an OES 2 SP2 virtual machine requires you to complete the following major tasks.

10.4.1 Specifying Options for Creating an OES 2 SP2 VM Guest

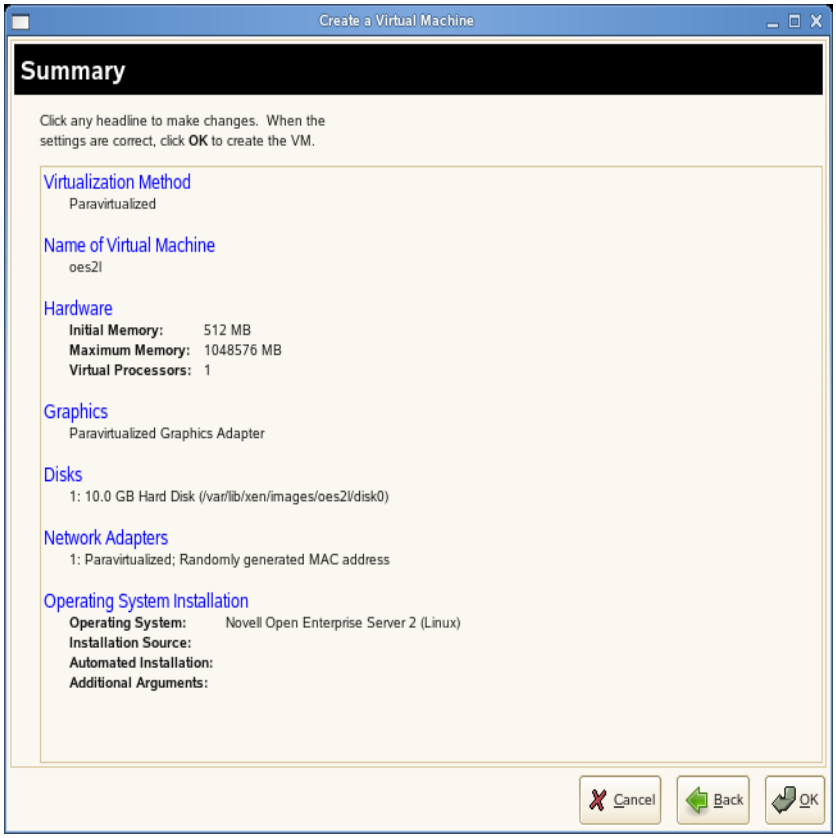
The Create Virtual Machine Wizard helps you through the steps required to create a VM guest and install the desired operating system.

1. Launch the Create Virtual Machine Wizard by using one of the following methods:
   - From the virtualization host server desktop, click *YaST* > *Virtualization* > *Create Virtual Machines*
   - From within Virtual Machine Manager, click *New*.
   - At the command line, enter `vm-install`.

   If the wizard does not appear or the `vm-install` command does not work, review the process of installing and starting the virtualization host server. The virtualization software might not be installed properly.
2. After specifying that you want to create a virtual machine, click *Forward*.
3. Click *Forward*.

   The option to set up a virtual machine based on an existing disk or disk image is only supported if the existing disk or disk image was originally set up through the Create Virtual Machine Wizard.
4. On the Type of Operating System page, select *Novell Open Enterprise Server 2 (Linux),* then click *Forward*.

   The Summary page appears.



NOTE: Detailed explanations of the Summary page settings are available in "Virtualization: Configuration Options and Settings (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/cha_xen_config_options.html)"in the *Virtualization with Xen (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html)* guide.

5 Click *Name of Virtual Machine*.

5a specify a name for the virtual machine in the *Name* field, then click *Apply*.

For example, you might specify *hostname*_vm, where hostname is the DNS name of the server you are installing in the VM.

6 Click *Hardware*.

6a Specify the amount of initial and maximum memory for the virtual machine to consume from the available memory. The initial memory should not be less than 1024 MB.

6b Specify the number of processors that you want the virtual machine to use.

6c Click *Apply*.

7 If you want to change the graphics adapter settings, click *Graphics* and select the type of graphic support desired, then click *Apply*.

8 Click *Disks*.

The Virtual Disk dialog lets you create the virtual disks that the OES 2 SP2 VM guest will have access to. This includes the installation media if you are installing from downloaded SLES and OES ISO image files.

Initially, a 10 GB file is specified for the partitions/volumes on the virtual server. The default location of the file is /var/lib/xen/images.

By default, this is a sparse file, meaning that although 10 GB is allocated, the size of the file on the disk will only be as large as the actual data it contains. Sparse files conserve disk space, but they have a negative impact on performance.

The OES 2 SP2 installation guidelines recommend 10 GB for a server installation. Keep in mind, however, that you are defining the total local disk size for the server. You should allocate as much local space as you anticipate the server needing for data and other files after it is hosting user services.

8a Specify the hard disk space you want to be available to the virtual machine.

8b Click *Apply*.

9 If you are installing SLES 10 SP3 from a downloaded ISO image file, click *CD-ROM*, browse to the SLES 10 SP3 image file, then click Open > OK > Apply.

10 If you are installing OES 2 SP2 from a downloaded ISO image file, click *CD-ROM*, browse to the OES 2 SP2 image file, then click Open > OK > Apply.

11 If you want to change the network adapter settings, click *Network Adapters*, view the default setting, edit the default settings, or click *New* and specify the setting for another network board of your choice, then click *Apply*.

12 Click *Operating System*:

12a If you are installing from a downloaded ISO image, make sure that the SLES 10 SP3 image is specified as the *Virtual Disk* installation source.

12b If you are installing from a network installation source, specify the URL for the SLES 10 SP1 network installation source.

You specify a network installation source for OES 2 SP2 during the install.

12c If you are using an AutoYaST control file to specify the settings for a virtual machine operating system, specify the path to the file in the *AutoYaST File* field or click the *Find* button to the right of the field to locate the file on the local host server.

12d If needed, use the *Additional Arguments* field to specify additional install or boot parameters to assist the installation.

For example, if you wanted to specify the parameters for an IP address of 192.35.1.10, a netmask of 255.255.255.0, a gateway of 192.35.1.254 for the virtual server, and use ssh to access the installation from another workstation, you could enter the following parameters in the *Additional Argument* field:

```
hostip=192.35.1.10 netmask=255.255.255.0 gateway=192.35.1.254 usessh=1
sshpassword=password
```

12e Click *Apply*.

13 Click *OK* to start the virtual machine and launch the operating system installation program.

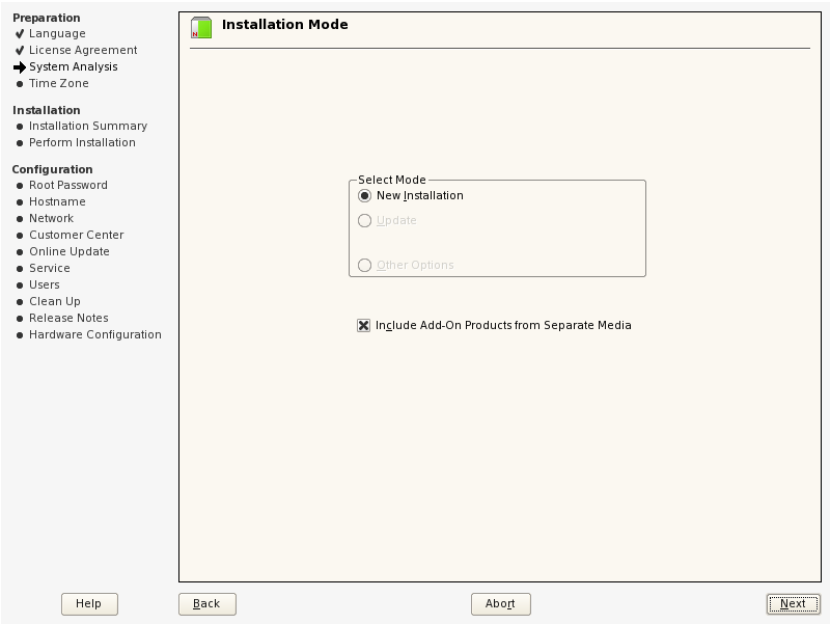
14 Continue with Section 10.4.2, “Specifying the Installation Mode,” on page 185.

10.4.2 Specifying the Installation Mode

When selecting the type of installation, select *New Installation*.

1 When the *Installation Mode* screen displays, select the following menu options, then click *Next*:

   1. *New Installation*
   2. *Include Add-On Products from Separate Media*



2 Continue with Section 10.4.3, “Specifying the Add-On Product Installation Information,” on page 185.

10.4.3 Specifying the Add-On Product Installation Information

When the *Add-On Product Installation* page displays:

1 Click *Add*.

2 If you are installing OES 2 from an ISO image file, do the following:

   2a In the Add-On Product Media dialog, click *Specify URL*, then click *Next*.

   2b In the URL field type

   ```
   hd:///?device=/dev/xvdc/
   ```

   2c Click *OK*.

   2d Skip to Step 4.

3 If you are installing from a network installation source, click the appropriate protocol for your situation, then click *Next* and supply the required information.

4 Read and accept the Novell Open Enterprise Server 2 license agreement, then click *Next*.

5 Confirm that the Add-On Product Installation page shows the correct path to the OES media, then click *Next*.

6 Continue with "Completing the OES 2 SP2 VM Guest Installation."

10.4.4 Completing the OES 2 SP2 VM Guest Installation

1 Follow the on-screen prompts, using the information contained in the following sections:

1a Section 3.3.4, "Setting Up the Clock and Time Zone," on page 48.

1b Section 3.3.5, "Specifying the Installation Settings for the SLES Base and OES Installation," on page 48.

1c Section 3.3.6, "Specifying Configuration Information," on page 54.

During the configuration portion of the installation, you might see additional prompts concerning hardware detection of the network cards, DSL, PPPoE DSL, ISDN cards, and modems.

When specifying the time source during the eDirectory configuration, use the same time source as the eDirectory tree you are installing the server into.

After the installation, enable the virtual machine's Independent Wall Clock setting and reboot the virtual machine so it can synchronize its time correctly. For more information on this configuration issue, "Virtual Machine Clock Settings (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/sec_guest_suse.html#sec_xen_time)" in the *Virtualization with Xen (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html)* guide.

1d Section 3.4, "Finishing the Installation," on page 71.

During the hardware configuration, graphics and sound cards are not recognized when installing OES 2 SP2 as a VM guest.

2 Complete the server setup by following the procedures in "Chapter 6, "Completing OES Installation or Upgrade Tasks," on page 145."

10.5 Upgrading an OES 2 VM Guest to OES 2 SP2

- Section 10.5.1, "Upgrading an OES 2 VM Guest using the Update Channel," on page 186
- Section 10.5.2, "Performing a Down-Server Upgrade," on page 186

10.5.1 Upgrading an OES 2 VM Guest using the Update Channel

Patching or updating an OES 2 SP2 VM guest is essentially the same as updating an OES 2 SP2 physical server. For instructions on updating a physical OES 2 SP2 server, see Section 5.4.5, "Upgrading Using the Patch Channel (Online)," on page 122.

10.5.2 Performing a Down-Server Upgrade

NOTE: The upgrade process using a network location or an ISO file is quite lengthy. Physical media upgrades are not supported.

If your guest VMs have access to a patch channel, we recommend that you upgrade using the patch channel. See Section 5.4.5, “Upgrading Using the Patch Channel (Online),” on page 122.

Performing a down-server upgrade on an OES 2 VM guest is similar in many ways to upgrading a physical machine, but there are important differences as outlined in the following sections:

Before You Start the Upgrade Process

1 Make sure you follow all of the applicable instructions and guidelines in Section 5.2, “Planning for the Upgrade to OES 2 SP2,” on page 114 and Section 5.3, “Meeting the Upgrade Requirements,” on page 115.

A Brief Overview of the Upgrade Process

When you perform a down-server upgrade on a physical server to OES 2 SP2, you must first shut down the server and then reboot it using the installation kernel and initial RAM disk (initrd) files on the SLES 10 SP3 installation media. This is accomplished by booting the server using a SLES CD or DVD, an ISO image file, or by accessing a SLES installation image on the network, for example, through a PXE or other remote connection.

Upgrading a VM guest also requires that you shut it down. However, when a Xen VM guest reboots, it doesn’t scan the local storage devices or attempt a PXE connection. Rather, it uses its configuration information to locate the kernel and other needed files on the host’s file system. The only way to affect the boot process of a VM guest is to modify its configuration.

Therefore, to upgrade a Xen VM guest, you must do the following as explained in the sections that follow.

1. Copy the installation/upgrade kernel and initial RAM disk (initrd) files to the VM host’s file system to be accessed through the modified configuration file, explained in the next point.
2. Create two copies of the VM guest configuration:
   - **A Modified Version:** You use this to start the upgrade process and run the first portion of the process.
   - **An Unmodified Version:** You use this to restore the guest’s operating environment for the second portion of the upgrade process.
3. Remove the VM guest’s configuration information from the Xen database so that it can boot using configuration files you create above.

Creating a Temporary Upgrade Directory on the VM Host

As explained in the overview above, the kernel and other files needed to run the upgrade must be accessible on the VM host's file system.

1 Create a directory on the VM host server for

- The installation kernel
- The initial RAM disk (initrd) file
- The configuration files that you need during the upgrade process.

The instructions that follow assume the directory is `/tmp/upgrade`, but you can use a different directory if you prefer.

(Conditional) Creating a Directory and Copying the ISO Files to the VM Host

If you plan to install from ISO image files on the VM host, do the following:

1 Create a directory for the files on your VM host server.

Because the images need to be available for future maintenance operations, they should be kept in a permanent location so that YaST knows where to find them.

2 Copy the ISO image files for your platform type.

Refer to the information on obtaining OES software in "Getting and Preparing OES 2 Software" in the *OES 2 SP2: Planning and Implementation Guide*.

Checking the Kernel Type

If you are upgrading a 32-bit VM guest, and you don't know whether it uses the non-PAE or PAE kernel, do the following:

1 Open a terminal on the VM guest.

2 Enter the following command:

```
uname -r
```

3 Note whether the kernel name ends in

- **xen:** Indicates the non-PAE kernel.

  or

- **xenpae:** Indicates the PAE kernel.

This determines which version of the kernel you must copy to the temporary upgrade directory.

Shutting Down and Preparing the VM Guest

1 On the VM host server, open Virtual Machine Manager, right-click the OES 2 guest server you are upgrading, and select *Shutdown*.

2 If you are upgrading using ISO image files, in Virtual Machine Manager click *View* > *Details* > *Hardware* > *Add* > *Storage Device*, browse to and select the SLES 10 SP3 ISO file.

3 Browse to and select the OES 2 SP2 ISO file.

Copying the Boot Files and Preparing the VM Guest Configuration Files

1 Copy the installation kernel and initrd files from your SLES 10 SP3 installation source > the `/boot/i386` or `/boot/x86_64` directory (depending on which architectural version you are upgrading) to the temporary directory you created in Step 1 on page 188.

If you are upgrading a 64-bit VM guest installation, the files are named `vmlinuz-xen` and `initrd-xen`.

If you are upgrading a 32-bit VM guest installation, choose the files that are appropriate for your hypervisor as determined in "Checking the Kernel Type" on page 188:

- `vmlinuz-xen` and `initrd-xen`

  or

- `vmlinuz-xenpae` and `initrd-xenpae`

2 Capture the VM guest's configuration in a file that you can modify to start the upgrade process.

At a terminal prompt, enter the following command:

`xm list -l` *`vm_name`* > */path/to/modify_config_file*.sxp

where *vm_name* is the name of the VM guest that you are upgrading as listed in the Virtual Machine Manager, and the path points to your temporary directory created in Step 1 on page 188 and specifies a filename that indicates it is modified for starting the upgrade process.

For example, you might type

```
xm list -l myserver_vm > /tmp/upgrade/modify_myserver_vm.sxp
```

3 Before modifying the configuration file you just created, change to the directory containing the file and make a copy of it to preserve the unmodified configuration by using the following commands:

`cd` */path/to/upgrade_directory*

`cp` *modify_config_file*.sxp *unmodified_config_file*.sxp

where *modify_config_file*.sxp is the name the configuration file you specified in Step 2 and *unmodified_config_file*.sxp is the name of the new file you will use to restore the VM guest's original configuration for the second phase of the upgrade process.

For example, you might type

```
cd /tmp/upgrade
cp modify_myserver_vm.sxp unmodified_myserver_vm.sxp
```

4 Verify that both of the configuration files are in your upgrade directory and then remove the VM guest's configuration from the Xen VM database using the following command:

`xm delete` *`vm_name`*

where *`vm_name`* is the name of the VM guest that you are upgrading.

For example, you might type

```
xm delete myserver_vm
```

The VM guest no longer appears in Virtual Machine Manager.

5 Using a text editor, open the configuration file to be modified that you created in Step 2 and change it as follows:

5a Remove the line that begins with `(bootloader_args ….`

5b Change the line that reads

```
(on_reboot restart)
```

to

```
(on_reboot destroy)
```

5c Remove the line that contains

```
(bootloader /usr/lib/xen/boot/domUloader.py).
```

5d Find the following indented lines:

```
(image
    (linux
        (kernel ...)
```

5e In the kernel line, before the closing parenthesis ")", modify the listed path (or insert a path if none is present) to point to the `vmlinuz-xen` or `vmlinuz-xenpae` file copied in Step 1.

For example, modify the kernel line so that it reads:

```
(kernel /tmp/upgrade/vmlinuz-xen)
```

or

```
(kernel /tmp/upgrade/vmlinuz-xenpae)
```

5f Insert a ramdisk line below the kernel line (or if a ramdisk line already exists, modify it) to point to the initrd file you copied in Step 1.

For example, insert or modify the line so that it reads:

```
(ramdisk /tmp/upgrade/initrd-xen)
```

or

```
(ramdisk /tmp/upgrade/initrd-xenpae)
```

5g In the args line, between the single quotes (' ') insert the path to your SLES 10 SP3 installation source.

For example, if you are upgrading a 64-bit installation from the network, you might modify the args line so that it reads:

```
(args 'install=http://myserver.mycompany.com/sles10-sp2/x86_64')
```

Or if you are upgrading a 64-bit installation from ISO files, you might modify the args line so that it reads:

```
(args 'install=hd:///?device=/dev/xvdx')
```

where *x*=the letter assigned to the SLES 10 SP3 ISO image file, for example .../xvdc.

5h Save the upgrade configuration file, then continue with the next section.

Starting the Upgrade

1 On the VM host server at a terminal prompt, enter the following command:

```
xm create -F /path/to/modify_config_file.sxp
```

For example, you might enter

```
xm create -F /tmp/upgrade/modify_myserver_vm.sxp
```

The VM guest appears again in Virtual Machine Manager.

2 Open the VM guest, then select the language and accept the SLES 10 SP3 license agreement.

3 Complete the first phase of the upgrade process by following the standard upgrade instructions, starting with Section 5.4.6, "Selecting the Installation Mode Options," on page 124.

IMPORTANT: Remember that you must specify the location URL for the OES 2 SP2 installation files, either using a network protocol, such as HTTP:// or using the device path assigned to the OES ISO, for example hd:///?device=/dev/xvdd.

Resuming and Completing the Upgrade

1 After you complete the instructions in Section 5.4.11, "Accepting the Installation Settings," on page 132, the server doesn't reboot automatically and the VM guest disappears from Virtual Machine Manager.

You must recreate the VM guest again to continue the upgrade process and complete the second phase. Enter the following command at the terminal prompt:

```
xm new -F /path/to/unmodified_config_file.sxp
```

For example, you might enter

```
xm new -F /tmp/upgrade/unmodified_myserver_vm.sxp
```

2 Open the VM guest and follow the standard upgrade instructions to completion, starting with Section 5.4.12, "Specifying Configuration Information," on page 133.

When the upgrade process is complete, you can remove the upgrade directory that you created in Step 1 on page 188.

10.6 Updating an OES 2 SP2 VM Guest

Patching or updating an OES 2 SP2 VM guest is essentially the same as updating an OES 2 SP2 physical server. For instructions on updating a physical OES 2 SP2 server, see Chapter 7, "Updating (Patching) an OES 2 SP2 Server," on page 149.

10.7 Managing a Virtual Machine Running OES 2 SP2

Managing a virtual machine running OES 2 SP2 is the same as managing virtual machines running other operating systems. For procedures, see "*Managing a Virtualization Environment* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/cha_xen_virtualization_manage.html)" in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html) guide.

10.8 Advanced Configuration Options

This section includes advanced configuration options that you need to set up these services on an OES 2 SP2 VM guest.

- Section 10.8.1, "Setting Up an OES 2 SP2 VM Guest to Use Novell Storage Services (NSS)," on page 192

10.8.1 Setting Up an OES 2 SP2 VM Guest to Use Novell Storage Services (NSS)

When you install OES 2 SP2 on a virtual machine, we recommend that you configure a virtual machine with multiple devices. Use the primary virtual disk as the system device with LVM2 (the YaST install default) as the volume manager. After the install, you can assign additional storage resources from the host server to the virtual machine. In the guest server environment, the additional disks can use LVM2 or EVMS as needed. In this scenario, NSS volumes are created only on additional virtual disks, not on the primary virtual disk that you are using for the guest server's system device.

IMPORTANT: When you create the virtual machine, make sure to configure the size of the primary virtual disk according to the amount of space you need for the `/boot`, `swap`, and root (`/`) volumes.

If you decide to use EVMS for the system device on the virtual machine, follow the install instructions in "Section A.2, "Configuring the System Device to Use EVMS," on page 214," just as you would for a physical machine.

After the virtual machine is set up, you need to perform additional tasks to set up additional Novell Storage Service (NSS) devices. See "Using NSS in a Virtualization Environment" in the *OES 2 SP2: NSS File System Administration Guide*.

Installing and Managing NetWare on a Xen-based VM

11

IMPORTANT: NetWare® 6.5 SP8 has been modified to run in paravirtual mode on a Xen virtual machine. Running NetWare in fully virtualized mode on a Xen host server is not supported.

You can install NetWare as a virtual machine guest (VM guest) operating system on a.

- SUSE® Linux Enterprise Server (SLES) 10 Linux server

  See "Setting Up a Virtual Machine Host" (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/cha_xen_virtualization_vhost_setup.html) in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html)guide.

  or an

- OES 2 SP2 server that has been set up as a Xen-based host server

  See "Chapter 9, "Installing OES as a Xen VM Host Server," on page 177" in the .

For general information on the Xen virtualization technology in SLES 10 SP3, see the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html)guide.

This section documents the system requirements, installation instructions, upgrade and migration instructions, and issues associated with setting up NetWare on a Xen-based virtual machine.

11.1 Introduction

There are many reasons to install NetWare 6.5 SP8 on virtual machines, such as:

- Incorporating a NetWare server into a production environment without committing additional hardware resources.
- Isolating Novell iFolder®, iPrint, GroupWise®, or other applications to a single virtual server without committing additional hardware resources.
- Extending the useful life of NetWare services by running them on a Linux host server, thereby taking advantage of the widespread industry support for Linux hardware drivers.

To simplify the process of installing virtualization software, the SLES 10 SP3 software includes *Xen Virtual Machine Host Server* as a primary server function that you can select when installing SLES 10 SP3 as a virtualization host server.

Selecting this pattern installs the Xen host server software, which enables the server to boot the Xen version of the SLES 10 SP3 operating system kernel. It also installs utilities for preparing and creating virtual machines.

After the host server is up and running, you can then create a virtual machine and install NetWare 6.5 SP8 as a guest operating system.

11.2 Support Information

11.2.1 OES 2 Registration Is Required for Support

Although OES 2 NetWare and NetWare 6.5 share the same code base and are the same in every way, virtualized NetWare in Xen is an OES 2 product feature. Support for NetWare on a Xen virtual machine is available only to OES 2 registered customers.

11.2.2 Supported Configurations and Features

The following configurations and features are supported for NetWare VM guest servers.

- OES 2 NetWare or later running in paravirtual mode.
- The graphical paravirtualized frame buffer and the text-based console interface.
- Running on 32-bit, 32-bit PAE, and 64-bit hypervisors.
- Running in 32-bit PAE compatibility mode on 64-bit platforms.
- Up to 16 block devices.
- Up to 32 virtual CPUs.
- The pause and resume functionality.
- The `xm shutdown` command.
- The `shutdown` command in Virtual Machine Manager.
- Allocated memory from 1 GB to 8 GB.
- VCPU covercommitment, pinning, and capping.
- Installations using a NetWare response file.

11.2.3 Unsupported Configurations and Features

The following configurations and features are not supported for NetWare VM guest servers.

- NetWare in full virtualization mode.
- NetWare 6.5 SP6 and earlier running on a virtual machine.

- VCPU hotplug.
- Network or block device hotplug.
- Virtual memory resizing.
- Direct access to physical devices.
- The save, restore, and migrate commands.
- Some Novell Remote Manager debugging features.

11.3 Preparing to Install a NetWare VM Guest Server

11.3.1 Planning for VM Host Servers

Meeting Server Hardware and Software Requirements

To accommodate NetWare VM guest servers, your VM host servers must:

- ❑ Meet the criteria specified in "Setting Up a Virtual Machine Host" (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/cha_xen_virtualization_vhost_setup.html) in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html) guide.
- ❑ Have enough memory (RAM) on the physical machine for
  - The SLES 10 operating system (512 MB)
  - Any of the supported OES services that you install on the VM host (512 MB)
  - Each NetWare virtual machine that you plan to run concurrently (1 GB to 8 GB)

  For example, if you are installing one NetWare VM guest server on a SLES 10 VM host server, you need a minimum of 1.5 GB of memory: 512 MB for the VM host server and 1 GB for the NetWare VM guest server. For optimal performance, you should allocate as much memory as possible for each NetWare VM guest, up to 8GB each.
- ❑ Have enough disk space on the host server for creating and running the VM guest servers.

  The default disk space for a NetWare VM guest server is 10 GB. You might need more or less space depending on what you will use the guest server for and what its storage configuration will be. You might want to locate your virtual machines on a separate partition or even on a separate storage device. For example, you might create a `/vm` partition on a separate drive installed in the server. For additional information, see "Storage Planning" on page 196.

Deciding Whether to Run OES Services on VM Host Servers

You should also decide whether to install OES 2 SP2 and one or more of its supported services on your VM host servers.

To ensure that optimal resources are available to the virtual machines, each VM host server should be dedicated to running the Xen virtualization software as much as possible. However, there are several good reasons why you might want to choose to install one or more of the supported OES services on the host server itself. For more information, see "Why Install OES Services on Your VM Host?" in the *OES 2 SP2: Planning and Implementation Guide*.

11.3.2 Planning for NetWare VM Guest Servers

Before creating NetWare virtual machines, you need to plan for the following:

- "RAM Planning" on page 196
- "Storage Planning" on page 196
- "Network Planning" on page 196
- "eDirectory Planning" on page 197

RAM Planning

To ensure the best performance by your NetWare VM guests, you should plan for the optimal RAM configuration of each NetWare VM guest server. As a general rule, the more RAM you assign to a NetWare guest server (up to 8 GB), the better the server performance will be. For specific planning information, see "Optimizing Server Memory" in the *OES2 SP1: Server Memory for NetWare Administration Guide*.

Storage Planning

The disk space that you allocate while creating the Xen virtual machines is used by the NetWare VM guest for the sys: volume.

For best performance in a Xen virtual environment, NSS pools and volumes on NetWare should be created on virtual devices that are SCSI devices, Fiber Channel devices, or iSCSI devices on the host server, or on partitions that are on those types of devices.

SATA or IDE disks have slower performance because special handling is required when working through the Xen driver to ensure data writes are commited to the disk in the order intended before it reports back.

For more information on NSS disk storage, see "Using NSS in a Virtualization Environment" in the *OES 2 SP2: NSS File System Administration Guide*.

Network Planning

Each Xen guest VM is assigned one virtualized network card by default. You can create additional cards if desired.

You must obtain one static IP address for each virtualized network card you plan to create on your NetWare VM guest servers. OES 2 SP2 does not support dynamically-assigned (DHCP) IP addresses.

eDirectory Planning

You can place a NetWare virtual machine in an existing tree or as the first server in a new tree. However, the performance of virtualized NetWare doesn't match a physical NetWare installation. In most cases, it is probably preferable to add your NetWare virtual machine to an existing tree located on a physical NetWare server, particularly if the tree is large.

Also, because virtualized servers might be started and stopped more often than they would normally be on physical servers, we recommend that the master replica (usually the first server in a tree) be placed on a system that is running at all times. For more information about Master Replicas, see "Managing Partitions and Replicas" in the *Novell eDirectory 8.8 Administration Guide*.

11.3.3 You Must Use Timesync for Time Synchronization

Because of known issues with Xen and the NTP NLM, you must use Timesync as the time synchronization method for NetWare VM guests running on Xen VM hosts. Otherwise, time drift causes problems for your NetWare VM guests.

Keeping accurate time is a cricital function for servers in an eDirectory tree. The reported time must be synchronized across the network to provide the expiration dates and time stamps necessary for ordering eDirectory events.

NetWare VM guest servers synchronize time in the same ways that NetWare physical servers do. In other words, the clock on the VM host server has no influence on the NetWare VM guest server's time.

IMPORTANT: To ensure your NetWare VM guest is configured correctly, be sure to follow the instructions in "Configuring Time Synchronization" (specifically Step 4) in the *NW65 SP8: Installation Guide*, and configure the NetWare VM guest to get time from the same time source as the eDirectory tree it is joining. If the time source specified is an NTP server, be sure to select the NTP option next to the source's DNS name or IP address. This enables Timesync to communicate with the NTP time source.

11.3.4 Disabling the Alt+Esc Shortcut on the Host

Alt+Esc is used on a NetWare server to switch between console screens, but on SLES 10 it moves between open windows. To provide the expected behavior for the virtualized NetWare server, you must disable the shortcut for SLES 10.

1. On the host server as the `root` user, click *Computer* > *Control Center*.
2. Click *Personal* > *Shortcuts*.
3. Under the *Window Management* category, click *Move between windows immediately*, then press the Backspace key to disable the shortcut.
4. Click *Close*.
5. Close the Control Center.

11.4 Installing Virtualized NetWare

This section provides the instructions for installing NetWare 6.5 SP8 as a guest OS.

- Section 11.4.2, "Creating a Response File for an Unattended NetWare Installation," on page 198
- Section 11.4.3, "Creating a Xen Virtual Machine and Installing a NetWare VM Guest Server," on page 200

11.4.1 Preparing the Installation Media

You must use the DVD installation files to install a NetWare VM guest on a Xen VM host server. (Xen on SLES 10 doesn't support CD swapping.)

The installation media must appear as a local disk to the virtual machine, but it can be physically located in either of the following locations:

- On a DVD in the host's physical DVD reader.
- As the DVD ISO image file copied to the Xen VM host server desktop.

The following steps are for downloading to the VM host server's desktop and can be adapted as necessary for the other locations listed above.

1. Using the Firefox* browser on the VM host server, access the Novell Open Enterprise Server 2 Downloand Instructions page (http://www.novell.com/documentation/oes2/esd/di_oes2_sp1.html) and download the `NW65SP8_OVL_DVD.iso` file to the server's desktop (or another arbitrary location of your choosing).
2. After the file downloads, if you are installing on an OES 2 SP2 VM host server by using a response file, continue with Step 3. Otherwise, skip to Section 11.4.3, "Creating a Xen Virtual Machine and Installing a NetWare VM Guest Server," on page 200.
3. Click *Open* in the Firefox download dialog box.
4. Sort the list of files by *Location* by clicking the column heading, then scroll to */LICENSE*.
5. Select the `.NFK` and `.NLF` files, right-click them, and select *Extract*.
6. In the Extract dialog box, click *Extract*, then close the ISO file and the browser.
7. Double-click the `LICENSE` folder on the desktop or other arbitrary location that you chose in Step 1, select the two files you extracted and drag them to the desktop, then delete the `LICENSE` folder by dragging it to the Trash.

Continue with the next section.

11.4.2 Creating a Response File for an Unattended NetWare Installation

OES 2 SP2 includes a YaST-based NetWare Response File Utility that asks you for information about the NetWare server you want to install. Basically, you answer the same questions as you would during a physical NetWare installation. When the time comes to run the NetWare Install program, the installation reads your responses from the file and proceeds without requiring further intervention.

1. Open YaST and click *Open Enterprise Server* > *NetWare Response File Utility*.
2. On the Select Install Type page, make sure the *Hardware Type* is set for *Virtual*. Do not change any other options. Click *Next*.

3. Click *Destination Address*, specify a valid NetWare server name for the virtualized NetWare server and the IP address you want the virtualized server to use.

   The IP address must be unique on the subnet just as it would be for a physical NetWare installation.

4. Click *Next*.
5. Click *Destination eDirectory*.
6. Specify the name of the eDirectory tree and a context for this server object.
7. In the *Replica Server IP Address* field, specify the IP address of the eDirectory server.
8. In the *User Information* section, specify the admin information for the tree, then click *Next*.
9. Click *License*, specify the eDirectory container where you want the NetWare license files stored (usually the Organization object), then click *Next*.
10. Click *Protocols*.
11. Specify the *Subnet Mask* and *Gateway* information for the subnet and click *Next*.
12. Click *Language*, change the language settings if needed, then click *Next*.
13. Click *SLP Configuration*.
14. If your tree has more than three servers, specify the valid SLP information before continuing, then click *Next*.
15. Click *DNS Configuration*, specify the DNS information, then click *Next*.
16. Click *Time Zone Configuration*, select your time zone options, then click *Next*.
17. Click *Time Sync Configuration*.
18. Leave the protocol set to TimeSync (do not select NTPv3), select *Use TIMESYNC Configured Sources*, and specify the same time synchronization source as your eDirectory server uses, select *NTP* if applicable, then click *Next*.
19. Click *Install Settings*, change the default settings if needed, add any needed SET parameters by clicking *Edit*, then click *Next*.
20. Click *Storage Configuration*, adjust the default sizes if desired, then click *Next*.
21. Click *Pattern Selection*, select the preconfigured server pattern you want installed, then click *Next*.
22. If you selected *Customized NetWare Server* in the previous step, click *Product Selection*, select the services you want installed, and click *Next*.
23. Click *NMAS Configuration* > *Next* > *Next*.
24. (Conditional) Depending on what products you selected for the server, click the headings and enter the required information until all the configuration options have been completed for the response file.
25. On the Save Response File page, specify a response filename, then browse to the directory where you stored your NetWare license files. (If you completed all of the instructions in Section 11.4.1, “Preparing the Installation Media,” on page 198 The field should show a path that ends with a forward slash (/).
26. If you want the VM Manager to launch automatically after you exit the Response File Generator, select *Launch VM Manager*.

IMPORTANT: If the option is not selectable, that means the server isn't running the Xen kernel. See Section 11.6.1, "VM Manager Doesn't Launch on a Xen VM Host Server," on page 206.

27 Specify the location of the Installation Source by browsing to the DVD `.iso` file that you copied to the local server, then click *Finish*.

28 Click *Next*.

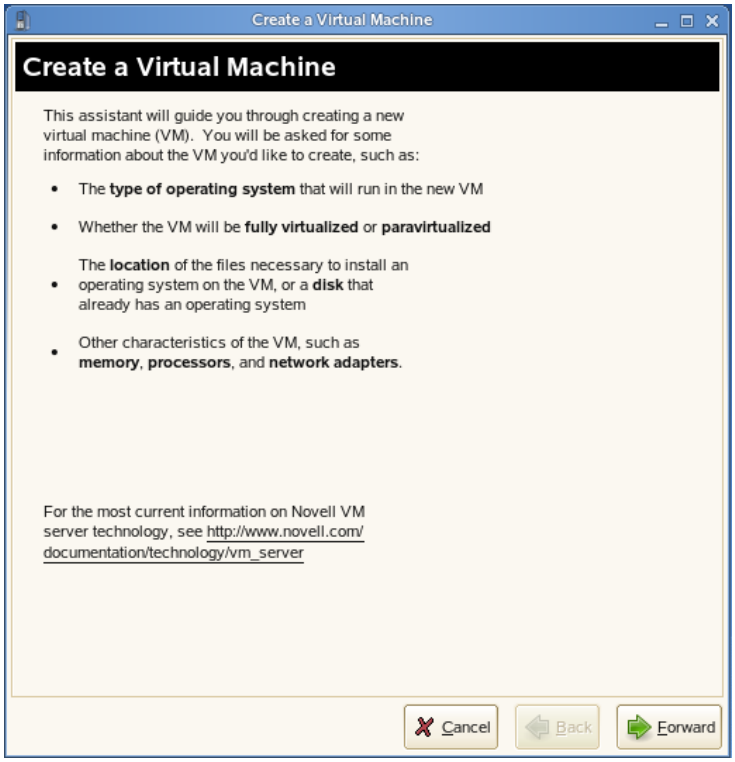
29 If you chose to automatically launch VM Manager in Step 26 above, click *Forward* and skip to Step 5 on page 202. Otherwise, continue with Section 11.4.3, "Creating a Xen Virtual Machine and Installing a NetWare VM Guest Server," on page 200.

11.4.3 Creating a Xen Virtual Machine and Installing a NetWare VM Guest Server

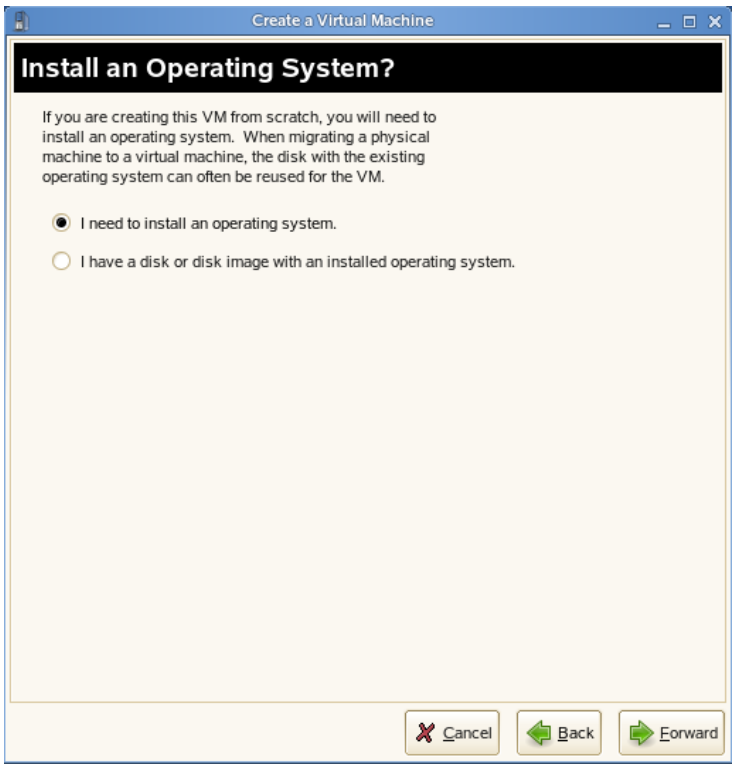
Follow these steps to create a Xen VM and install a NetWare VM guest server.

1 Open YaST, then click *Virtualization* > *Create Virtual Machines*.

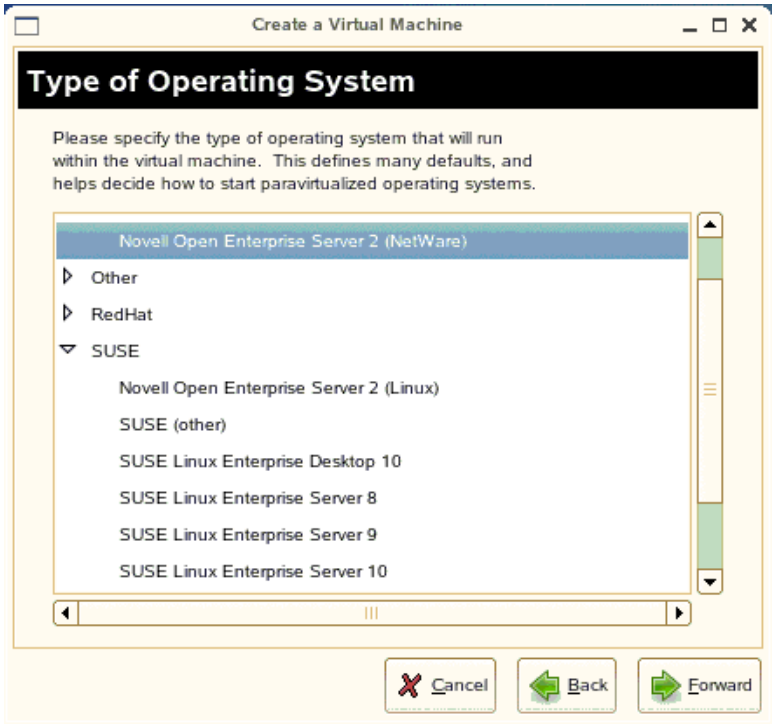
2 Read the Create a Virtual Machine welcome page, then click *Forward*.



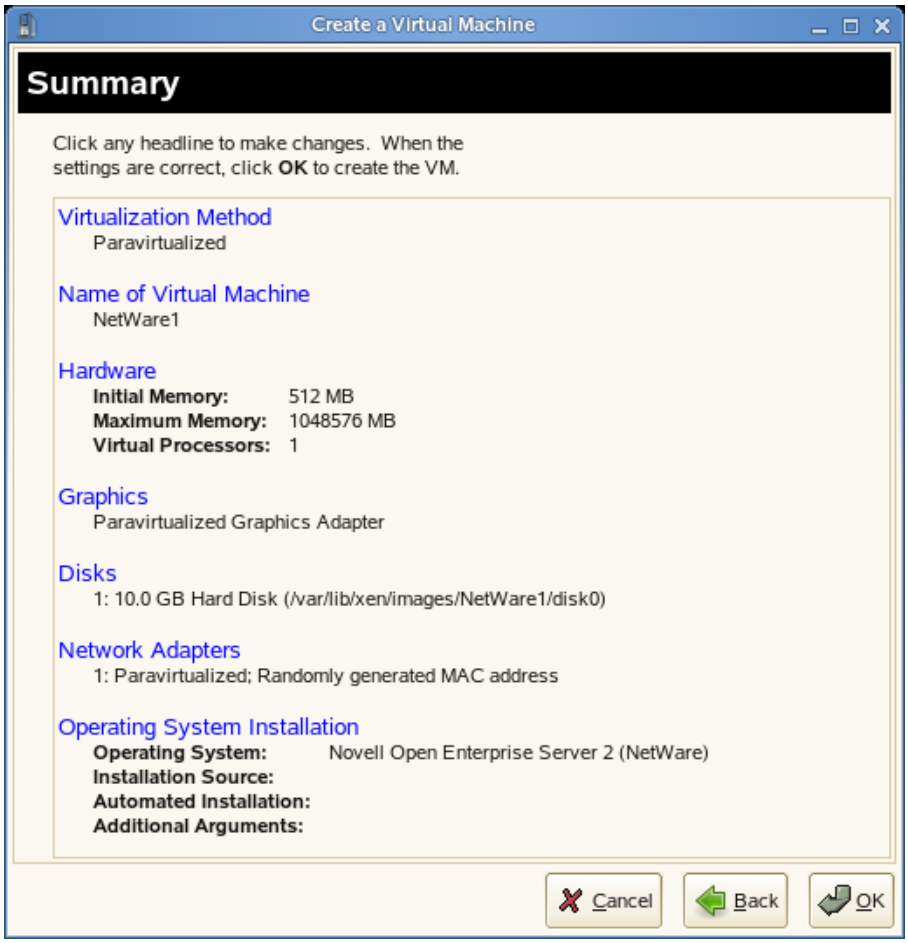
3 Select *I need to install an operating system*, then click *Forward*.



4 Click the triangle by *NetWare*, select *Novell Open Enterprise Server 2 (NetWare)*, then click *Forward*.



The Summary page appears, showing the settings to be used for the virtual machine.



5 Click *Name of Virtual Machine*.

Specify the name that you want displayed for this virtual machine in the Virtual Machine Manager.

For example, you might specify *hostname*_vm, where *hostname* is the host name of the server you are installing.

6 Click *Hardware*.

Change the initial memory setting to at least 1024 MB and the maximum setting to as much as 8GB, depending on the RAM available on your host server.

Add additional virtual processors if desired.

7 Click *Disks*.

The Virtual Disks dialog box lets you create the virtual disks that the NetWare VM guest will have access to. This includes the installation media if you are installing from a DVD on the host server or from an ISO image file copied to the host server's storage devices.

Initially, a 10 GB file is specified for the partitions/volumes on the virtual server. The default location of the file is `/var/lib/xen/images`.

By default, this is a sparse file, meaning that although 10 GB is allocated, the size of the file on the disk will only be as large as the actual data it contains. Sparse files conserve disk space, but they have a negative impact on performance.

The NetWare install allocates 500 MB for a DOS partition and 4 GB for the SYS: volume. The default disk size of 10 GB leaves about 5.5 GB for other partitions.

8 If you want to change the location of the NetWare VMs first virtual hard drive, select the default *Hard Disk* and click *Edit*. Then modify the path in the Server field to where you want the virtual disk located.

Make sure that you have enough physical disk space on the host server's hard drive and partition specified to accommodate the maximum size of the virtual disk.

9 If you want optimal performance, your should deselect the sparse file option. This creates a blank file of the selected size when you start the virtual machine installation.

10 Click *OK*.

11 If you are installing from a mounted DVD, click *CD-ROM*, browse to `/dev/cdrom` or `/dev/dvd`, then click *Open* > *OK* > *Apply*.

12 If you are installing from a downloaded ISO image file, browse to the image file, then click *Open* > *OK* > *Apply*.

13 If you want multiple virtual network adapters, click *Network Adapters*.

Create virtual network adapters for the server.

The default setting is a single paravirtualized network adapter.

14 (Conditional) If you are installing on an OES 2 SP2 VM host and you created a response file that you want to use for the NetWare installation, click *Operating System Installation* and complete the following tasks:

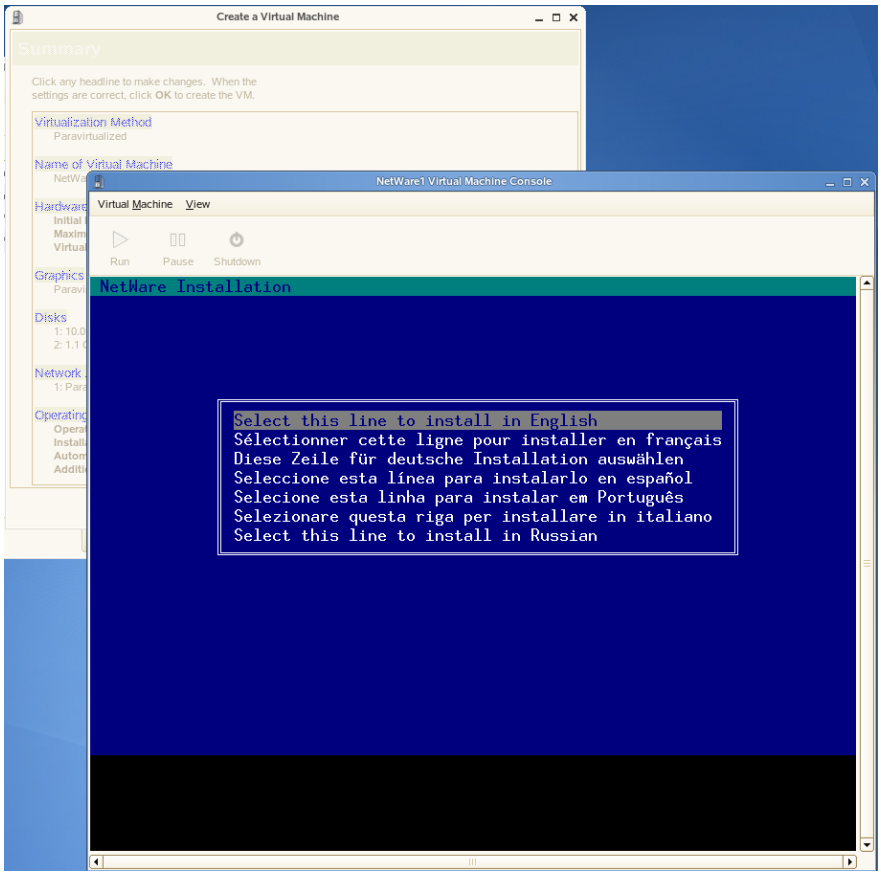
14a Click *Find*, then browse to and select the file you created in Section 11.4.2, "Creating a Response File for an Unattended NetWare Installation," on page 198.

14b Click *Open* > *Apply*.

The response file 's path and filename should be displayed in the Automated Installation field on the Summary page.

15 When you have the virtual machine settings the way you want them, click *OK* to proceed with the creation of the virtual machine and the installation of the virtual NetWare server.

A VNC viewer window appears, displaying the progress of the NetWare install program.



If you specified a response file, the installation uses the information you recorded in the response file. If a required parameter is missing in the response file, you are prompted to enter the desired values during the installation.

If you did not specify a response file, you must do the following:

15a Click inside the installation window to set the mouse pointer.

The mouse is not used on the first few screens, but you must set it now. Otherwise, the mouse and the keyboard might not work as expected when the GUI pages appear.

15b Enter all of the installation information as you would for a physical NetWare installation.

IMPORTANT: Do not close the VNC viewer window while the NetWare install program is running. Doing so prevents the installation from completing properly.

11.5 Managing NetWare on a Virtual Machine

Virtualized NetWare is managed in the same way as if it were running on a physical machine. For information about managing your NetWare server, see the *OES2 SP1: Server Operating System for NetWare Administration Guide*. For additional information about managing NetWare servers in a virtualized environment, see "Running OES 2 NetWare in a Virtualized EnvironmentOES2 SP1: Server Memory for NetWare Administration Guide" in the same guide.

11.5.1 Using the Virtual Machine Manager

Managing a NetWare virtual machine is simplified by using the Virtual Machine Manager utility, which is installed by default when you install the Xen virtualization software.

To start Virtual Machine Manager, open a terminal prompt and enter `virt-manager`.

For more information, see "*Managing a Virtualization Environment* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/cha_xen_virtualization_manage.html)" in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html) guide.

11.5.2 Using the Command Line

Many NetWare administrators prefer to manage the server by command line. If you want to use the command line, you should be aware of issues related to the following:

- "Terminal Size" on page 205
- "NetWare Debugger" on page 205
- "VNC Viewer" on page 205
- "The xm Commands" on page 205

Terminal Size

The terminal window might display only 80x24 characters. If you don't want to scroll to the command line, you need to resize the terminal.

NetWare Debugger

If pressing Alt+Shift+Shift+Esc doesn't launch the debugger, you can enter `386debug` at the command line to launch the debugger.

VNC Viewer

In the VNC Viewer, pressing F8 displays a pop-up utility menu. Press F8 twice to pass single F8 to the remote side.

The xm Commands

- You can also manage the NetWare virtual machine, and all other virtual machines, by using the `xm` command line tools. For more information, see "The xm Command (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/sec_xen_virtualization_xm.html)" in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html) guide.
- To make a break in NetWare from a terminal, enter `xm sysrq x c`, where x is the domain ID and c is any keyboard character.

11.6 Troubleshooting

This section gives you a list of troubleshooting suggestions that can help you resolve some of the NetWare® installation issues.

- Section 11.6.1, “VM Manager Doesn’t Launch on a Xen VM Host Server,” on page 206

11.6.1 VM Manager Doesn’t Launch on a Xen VM Host Server

If the option to launch the VM Manager for installing a NetWare guest is not available, the most likely cause is that the Xen kernel is not running on the Xen VM host server. See *The Boot Loader Program* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/sec_xen_config_bootloader.html) in the *Virtualization with Xen* (http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html) guide.

Upgrading NetWare on a Xen-based VM

12

12.1 Upgrading the VM Host Server

Before you upgrade the NetWare VM guest servers on any Xen-based VM host servers, be sure to upgrade the host server to either SLES 10 SP3 or OES 2 SP2, as applicable.

For SLES 10 SP3 upgrade instructions, see the *SLES 10 SP3 Installation and Administration Guide (http://www.novell.com/documentation/sles10/book_sle_reference/data/book_sle_reference.html)*.

For OES 2 SP2 upgrade instructions, see “Chapter 5, “Upgrading to OES 2 SP2,” on page 113.”

12.2 Upgrading the NetWare VM Guest Server

After you have upgraded the Xen VM host server, upgrading a NetWare 6.5 guest on the host server is the same as upgrading a physical installation. You accomplish this by installing the Support Pack 8 (SP8) (which is the same thing as NetWare 6.5 SP8) on the server.

The only difference with upgrading a NetWare VM guest is the process of providing access to the SP8 media.

If the support pack is unzipped to a location on the Guest, such as the `sys:` volume, the process of installing the support pack is exactly the same as on a physical server.

If the support pack is unzipped on a DVD or to a location on the host server, you must add the DVD or location to the VM guest. Keep in mind that you can only specify a block device, such as a mounted DVD or the root of a separately defined partition on the VM host server. You cannot specify a directory where you’ve unzipped the support pack files as a block device for the VM guest to access.

12.2.1 Downloading the NetWare SP8 Zip File

1. Log into your Novell account and access the NetWare 6.5 SP8 e-Media Kit (URL_goes_here).
2. Download the `NW65SP8.zip` file.
3. Extract the Support Pack files contained in the zip file you downloaded.
4. Complete the following step that applies to your situation.
   - **4a** If you have extracted the file so a root-level directory on the VM guest, continue with the instructions in “Starting an Upgrade” in the *NW65 SP8: Installation Guide*.
   - **4b** If you have extracted the file to a partition on the VM host, see the Virtualization with Xen (http://www.novell.com/documentation/sles10/xen_admin/data/bookinfo.html) guide for information on making a block device available to a VM guest.

IMPORTANT: After adding the block device, you will probably need to reboot the NetWare VM guest before it will recognize it.

4c If you have extracted the file to a DVD, continue with Providing Access to a Mounted DVD.

12.2.2 Providing Access to a Mounted DVD

After downloading the `NW65SP8.zip` file and extracting it to a DVD, do the following:

1. Insert the DVD in the VM host server.
2. On the desktop, click *Computer* > *Virtual Machine Manager*.
3. Select the NetWare VM guest you are upgrading, then click the *Details* button.
4. Click the *Hardware* tab.
5. Click the *Add* button.
6. In the *Hardware Type* drop-down list, select *Storage Device*, then click *Forward*.
7. Under *Target* in the *Device Type* drop-down list, select *Virtual Disk (read only)*.
8. With the *Normal Disk Partition* option selected, click *Browse*.
9. In the *Places* column, double-click *File System*, then double-click the `dev` folder.
10. Click the `dvd` device file, then click *Open*.
11. Click *Forward* > *Finish*.

    You should see a new disk in the *Hardware* list.
12. In the NetWare VM guest's Machine Console, open the file browser.
13. If the DVD is listed, write down the volume name listed, then go to "Installing the Support Pack" (Step 2) in the *NW65 SP8: Installation Guide* and complete the instructions there.

    If the DVD is not listed, continue with Step 14.
14. Shut down and restart the NetWare VM.
15. After the VM restarts, confirm that the DVD is listed, write down the volume name listed, then go to "Installing the Support Pack" (Step 2) in the *NW65 SP8: Installation Guide*.

Disabling OES 2 Services

13

Although you can uninstall Novell™ Open Enterprise Server 2 (OES) Linux service RPMs using YaST, we do not recommend it because so many modules have interdependencies. Uninstalling services can leave the server in an undesirable state. Instead, we recommend disabling the service.

1. Log in as `root` and start YaST.
2. Click *System* > *System Services (Runlevel)*.
3. Select *Expert Mode*.
4. Select the *applicable_service_name,* then click *Set/Reset* > *Disable the service*.
5. Repeat Step 4 for each service you want to disable.
6. Click *Finish* to exit the YaST Runlevel tool.

NOTE: YaST does not support removing products that create objects or attributes in eDirectory™. You need to use iManager to remove these objects and attributes. For procedures, see "Deleting an Object" in the *Novell iManager 2.7.3 Administration Guide*.

Security Considerations

14

This section includes issues that you should consider when installing and configuring an Novell® Open Enterprise Server 2 (OES) Linux server.

14.1 Password for User Admin Written in Clear Text in control.xml

When you create a `control.xml` file using AutoYast, the eDirectory password for user Admin is written in clear text. This password can be read by anyone who has access to the file. Linux passwords are stored in the file in a hashed form.

We recommend controlling access to this file.

14.2 Access to the Server During an Installation or Upgrade

Because eDirectory passwords are not obfuscated in system memory during the installation or upgrade, we recommend not leaving a server unattended during the installation, upgrade, or configuration.

You can use ssh (secure shell) to access the system to perform an installation. However, only authorized users can access the installation.

14.3 Remote Installations Using VNC

While installing the server, we recommend that you do not use Virtual Network Computing (VNC) for remote installation in an untrusted environment. Consider using one of the more secure options (for example SSH) as outlined in “Installation Scenarios for Remote Installation” in the *SLES 10 Installation and Administration Guide* (http://www.novell.com/documentation/sles10/book_sle_reference/data/sec_deployment_remoteinst_scenario.html).

14.4 Improperly Configured LDAP Servers

Issue 1: Improperly configured LDAP servers will allow any user to connect to the server and query for information

eDirectory LDAP server enables NULL BIND by default, but allows it to be disabled on the server. To enhance the security of the OES server, disable the NULL bind on the LDAP server port 389. See “Configuring LDAP Services for Novell eDirectory” in the *Novell eDirectory 8.8 Administration Guide*.

Issue 2: Improperly configured LDAP servers will allow the directory BASE to be set to NULL. This allows information to be culled without any prior knowledge of the directory structure. Coupled with a NULL BIND, an anonymous user can query your LDAP server using a tool such as LdapMiner.

An eDirectory LDAP server allows the directory BASE to be set to NULL, and there is no way to disable it. However, with the NULL BIND disabled, as previously mentioned, the security threat posed by this feature is minimized.

Installing with EVMS as the Volume Manager of the System Device

A

This section describes how to modify the default partitioning scheme for the system device during the install of Novell® Open Enterprise Server 2 (OES) Linux server and Novell Storage Services™ (NSS) so that its system device is managed by the Enterprise Volume Management System (EVMS) instead of the Linux Volume Manager 2 (LVM2).

IMPORTANT: For the purpose of this documentation, a system device is any device that contains the Linux `/boot`, `swap`, or root (`/`) partitions for your OES 2 server.

A.1 Using EVMS to Manage the System Device

The Novell Storage Services file system requires that the Enterprise Volume Management System (EVMS) be used as the volume manager of devices that contain (or will contain) NSS pools and volumes. NSS management tools cannot see devices managed by non-EVMS volume managers, so those devices and the space on them are unavailable for creating NSS pools and volumes. EVMS also makes it possible to use the full range of services that NSS offers. NSS is not supported or tested for non-EVMS volume managers.

IMPORTANT: NSS management tools require that the devices you use for NSS pools and volumes be managed by EVMS.

For a list of the NSS capabilities that are not available when using a non-EVMS volume manager, see "NSS Limitations for Non-EVMS Volume Managers" in the *OES 2 SP2: NSS File System Administration Guide*.

SUSE® Linux Enterprise Server 10 supports LVM2 and EVMS as volume managers; however, a given device can be managed by only one volume manager at a time. LVM2 is the default volume manager for SUSE Linux. During the install, the YaST *Installation Settings* page automatically recommends a partitioning scheme that uses LVM2 as the volume manager of the primary device and that allocates the entire disk for the Linux system partitions and POSIX file systems.

This default partitioning scheme creates two problems for administrators who want to use NSS pools and volumes on the same device as the system partitions.

- NSS management tools cannot see devices that are managed by LVM2. Therefore, any unpartitioned free space on the system device is not available to be used for NSS pools and volumes.
- The default LVM partitioning scheme allocates the entire device for Linux POSIX file systems, so there is no free space available to be used later.

Possible workarounds for these problems are:

- **(Recommended) Use Additional Disks for NSS Pools and Volumes:** Use multiple devices on the server, and reserve the system device for system partitions and Linux POSIX file systems. Create NSS pools and volumes on the non-system disks only.

  This solution does not require that the system device be managed by EVMS. During the install, use LVM2 as the volume manager for the system device. Do not partition or configure the non-system devices during the install. Otherwise, follow the install procedures described elsewhere in this guide. Any free space on the LVM2-managed system device is not seen by NSS management tools and is not available for creating NSS pools.

  After the install, you can create NSS pools or Linux POSIX file systems on other EVMS-managed devices.
- **(Supported) Modify the Partitioning Scheme During Install:** At install time, modify the partitioning scheme for the system device to use EVMS and to leave unpartitioned free space available on the device that can be used later for NSS pools.

  NOTE: This option applies to physical machines. With virtual machines, you can easily add a second virtual disk to use for NSS pools and volumes.

  Beginning in OES 2 SP2, the Partitioner in the YaST Install offers the *Create EVMS Based Proposal* option. Follow the procedure in Section A.2, “Configuring the System Device to Use EVMS,” on page 214.

  After the install, you can create NSS pools or Linux POSIX file systems on the system device and on any additional disks. For information about creating NSS and Linux POSIX file systems on EVMS-managed devices, see Section A.3, “Using EVMS to Manage Devices,” on page 219.

A.2 Configuring the System Device to Use EVMS

Beginning in OES 2 SP2, the Partitioner in the YaST Install offers the *Create EVMS Based Proposal* option. For unpartitioned devices over 20 GB in size, this option creates a boot partition and a system partition for the container that holds the swap and / (root) volumes.

A.2.1 Understanding the EVMS Based Partitioning Scheme

Using EVMS to manage the system device allows you to later add NSS pools and volumes on any unpartitioned free space on it. You must modify the partitioning scheme to use EVMS during the install. It is not possible to change the volume manager for the system device after the install.

Beginning in OES 2 SP2, the Partitioner in the YaST Install offers the *Create EVMS Based Proposal* option to automatically create an EVMS solution for the system device. For unpartitioned devices over 20 GB in size, this option creates a boot partition and a container for the swap and / (root) volumes in up to the first 20 GB, and leaves the remainder of the space on the device as unpartitioned free space.

Table A-1 shows the default proposed setup for a machine with 768 MB RAM. The default swap size is 1 GB or larger, depending on the size of the RAM on your machine. The remainder of the device is left as unpartitioned free space.

Table A-1 *Default EVMS Proposal for Devices over 20 GB in Size*

Device	Size	Type	Mount Point
/dev/sda1	70.5 MB	Ext2	/boot
/dev/sda2	14.9 GB	Linux LVM	
/dev/evms/lvm2/system	14.9 GB	EVMS lvm2/system	
/dev/evms/lvm2/system/root	10.0 GB	EVMS	/
/dev/evms/lvm2/system/swap	1.1 GB	EVMS	swap

A.2.2 Prerequisites

This setup assumes that you have a single device in your physical server and you want to add NSS pools and volumes on the device after the install.

- The device is unpartitioned.

  If the device has existing partitions, you can remove them all or specify which ones to keep during the install as described in Step 3 on page 216.

- The device is over 20 GB in size.

A.2.3 Modifying the Installation Settings

The procedure in this section describes how to use the *Create EVMS Based Proposal* option in the YaST Partitioner to modify the partitioning settings during the install of OES 2 SP2 Linux or later.

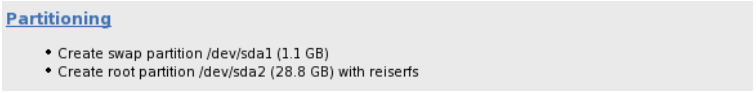
IMPORTANT: The procedure assumes SCSI devices and refers to device node names with the `sdn` notation. Other device drivers use different notation for device node names. For example, IDE drives use the `hdn` notation.

1. Begin the SLES 10 SP3 install for OES 2 SP2 Linux.

   For information, see "Installing OES 2 SP2" on page 39.

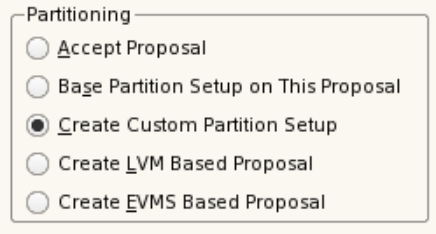
2. When the installation reaches the *Installations Settings* page, select *Partitioning* to open the Partitioner where you can modify the default device setup.

   For example, a default device setup might look like the one below:

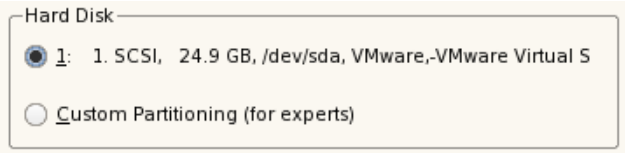


3 If the device is already partitioned, you must remove some or all of the partitions before you use the EVMS based partitioning proposal.

3a On the *Suggested Partitioning* page under *Partitioning*, select *Create Custom Partition Setup*.



3b On the Preparing Hard Disk: Step 1 page, select the disk, then click *Next*.



3c On the Preparing Hard Disk: Step 2 page under *Disk Areas to Use*, do one of the following to specify which partitions can be deleted:

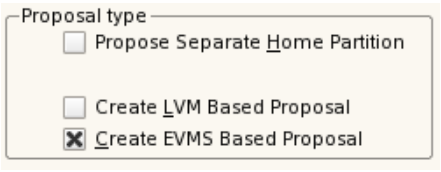
WARNING: The data on the deleted partitions will no longer be available.

- **Keep One or More Partitions:** Select only those partitions that can be deleted; deselect (clear the check box) the partitions that you want to keep.

This allows you to keep partitions that you want to keep if they have data on them, and you don't want them to be deleted. This is very important if the disk was used previously, and has an NSS partition with pools that you want to keep.

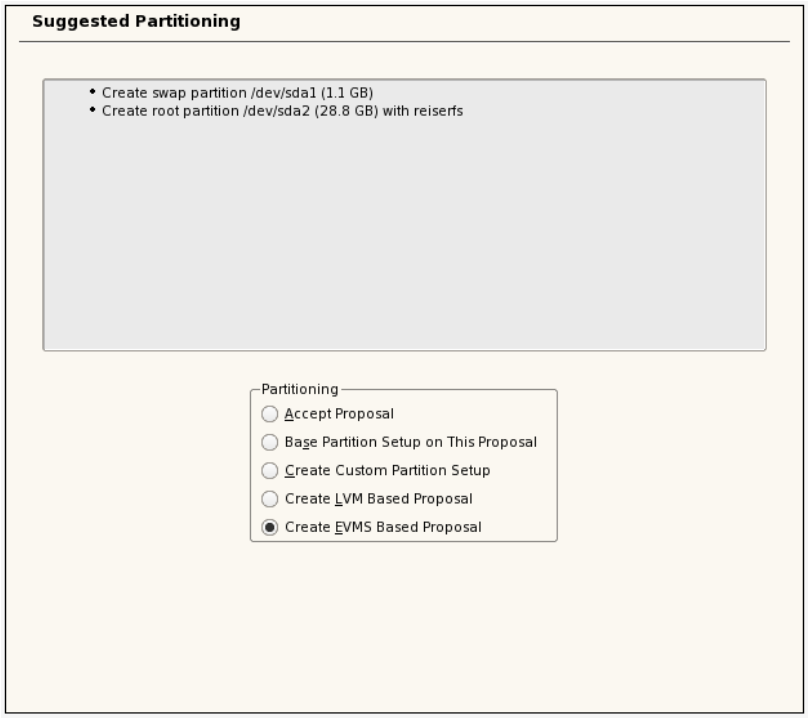
- **Remove All Partitions:** Click the button to use the *Entire Disk*. All of the partitions on the disk are selected for deletion.

3d On the Preparing Hard Disk: Step 2 page under *Proposal type*, select *Create an EVMS Based Proposal*.



3e Skip ahead to Step 5.

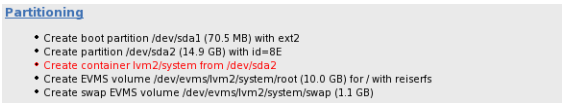
4 If the device is unpartitioned, on the *Suggested Partitioning* page under *Partitioning*, select *Create EVMS Based Proposal*.



5 Click *Next* to create the default EVMS-based partitioning scheme.

This deletes the LVM2 proposed partitions and the related partition table on the disk. It replaces it with the EVMS proposed partitions and setup described in Section A.2.1, “Understanding the EVMS Based Partitioning Scheme,” on page 214.

On the Installation Settings page, the new EVMS partitioning scheme is displayed.



6 Modify the software settings to install NSS.

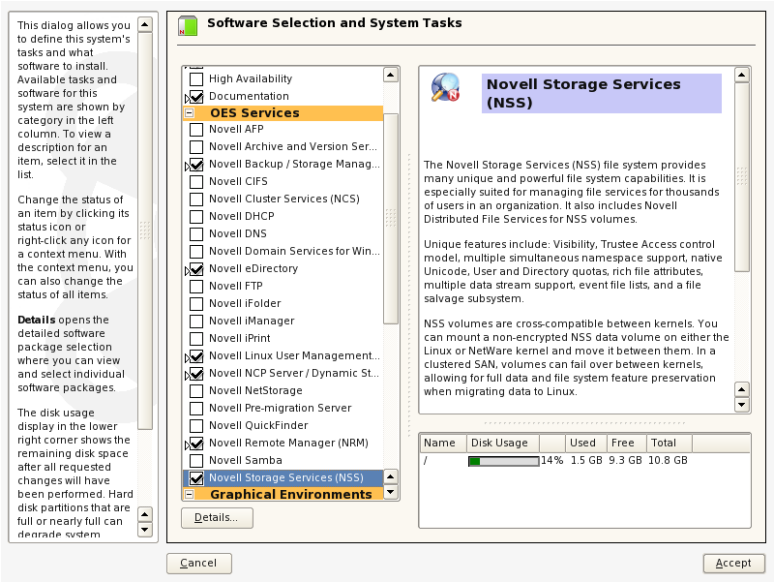
IMPORTANT: This step describes essential services for NSS. You can optionally install other OES 2 services on the same server.

6a On the *Installations Settings* page, click *Software* to go to the *Software Selections and System Tasks* page.

6b Select *Novell Storage Services* from the available *OES Services* options.

Novell Distributed File Services is part of NSS, so it is automatically installed whenever you install NSS. When you select *Novell Storage Services*, the following additional OES services are automatically selected:

- Novell Backup / Storage Management Services™
- Novell eDirectory™
- Novell Linux User Management
- Novell NCP™ Server / Dynamic Storage Technology



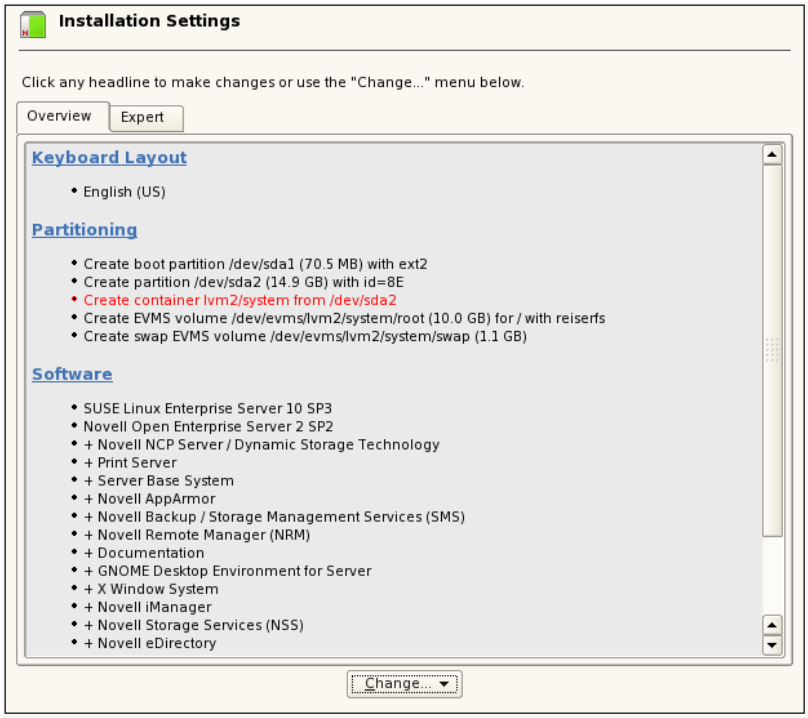
6c Optionally select *Novell iManager* to be installed on the server.

You must install iManager somewhere in the same tree as the server. If you install iManager and NSS on the same server, the storage-related plug-ins are automatically installed.

If you install iManager on a different server, make sure you install the storage-related plug-ins that you need to manage NSS file system and services. For information about installing storage-related plug-ins on an existing server, see "Novell iManager and Storage-Related Plug-Ins" in the *OES 2 SP2: NSS File System Administration Guide*.

6d Click *Accept* to return to the *Installation Settings* page.

Licensing dialog boxes might open where you are prompted to accept proprietary modules being installed.



7 Continue with the OES 2 installation.

Refer to the product documentation for information about configuring OES Services that are being installed. For general information about the install, see "Installing OES 2 SP2" on page 39.

A.3 Using EVMS to Manage Devices

You can use the free space on the system device for NSS or Linux POSIX file systems. Consider the guidelines below when working with EVMS-managed devices.

- Section A.3.1, "NSS File Systems on EVMS-Managed Devices," on page 219
- Section A.3.2, "Linux POSIX File Systems on EVMS-Managed Devices," on page 220

A.3.1 NSS File Systems on EVMS-Managed Devices

Use only NSS tools (such as NSSMU and the Storage plug-in to iManager) to create a pool on a new EVMS-managed device. The tools automatically carve out a partition with the DOS Segment Manager so that the device can be used later for either NSS or Linux POSIX file systems. Then it adds the NetWare Segment Manager and creates the NSS partition and pool.

For the best performance, if you plan to use a non-system device for both NSS and Linux POSIX file systems, create the NSS file systems on the device first. NSS partitions the device in a manner that ensures the best performance for the NSS file systems, and does not adversely affect performance for Linux POSIX file systems.

For instructions for creating pools and volumes, see the "Managing NSS Pools" and "Managing NSS Volumes" in the *OES 2 SP2: NSS File System Administration Guide*.

A.3.2 Linux POSIX File Systems on EVMS-Managed Devices

Use the Linux EVMSGUI tool (evmsgui) to create Linux POSIX file systems on the EVMS-managed device. For EVMS-managed devices, Linux POSIX file systems require that the Linux partitions be managed by the DOS Segment Manager (DOSSegMgr). This will be laid down automatically if you create an NSS file system on the device first.

WARNING: EVMS administration utilities (evms, evmsgui, and evmsn) should not be running when they are not being used. EVMS utilities lock the EVMS engine, which prevents other EVMS-related actions from being performed. This affects both NSS and Linux POSIX volume actions.

NSS and Linux POSIX volume cluster resources should not be migrated while any of the EVMS administration utilities are running.

Consider the following guidelines when working with evmsgui to create a Linux POSIX partition:

Scenario	To create the Linux partition in evmsgui:
Free space is controlled by the DOS Segment Manager.	Create the Linux partition as usual.
Disk is not initialized.	1. Select *No* at the prompt to initialize. On a pure SLES system (no NSS), ignore this step. 2. Delete the disk object from the *Volumes* tab. 3. Add the DOS Segment Manager to the device. 4. Create the Linux partition as usual.
Free space is controlled by the NetWare Segment Manager.	Do one of the following: ◆ If no partitions are on the device, remove the NetWare Segment Manager from the device, add the DOS Segment Manager, then create the partition as usual. **WARNING:** Changing the segment manager initializes the disk again (destroys existing data), so you only want to do this with disks that have no partitions on it, or if you do not want any of the partitions that are currently on the disk. ◆ If partitions exist, reboot the server to automatically give control of the device back to the DOS Segment Manager, then create the partition as usual.

If no partitions are on the device, do the following to add a DOS Segment Manager to a non-clustered device:

1. Log in as the `root` user, open a terminal console, then enter

   ```
   evmsgui
   ```

2. If necessary, remove the NetWare Segment Manager:

   2a Click the *Disks* tab, then locate and select the device, such as device `sdb`.

   2b Right-click, then select *Remove segment manager from Object*.

   This option appears only if there is an existing segment manager for the selected disk.

   2c Select the listed segment manager, click *Remove*, then click *OK*.

   WARNING: All data on the selected disk space is destroyed.

   2d Click *Save*, then click *Save* again to save your changes.

3. Add the DOS Segment Manager.

   3a From the evmsgui menu, click *Actions* > *Add* > *Segment Manager to Storage Object*.

   3b On the Add Segment Manager to Storage Object page, choose *DOS Segment Manager*, then click *Next*.

   3c On the Select Plugin Acceptable Objects page, choose the device where you want to add the segment manager, then click *Next*.

   3d On the Configurable Options page, select the disk type (Linux is the default), click *Add*, then click *OK*.

   3e Click *Save*, then click *Save* again to save your changes.

4. Create a segment for the DOS Segment Manager.

   The DOS Segment Manager requires you to create a segment before creating an EVMS volume. Without a segment, the additional segment manager does not appear when you attempt to create an EVMS volume.

   4a From the evmsgui menu, click *Actions* > *Create* > *Segment*.

   4b On the Create Disk Segment page, select *DOS Segment Manager*, then click *Next*.

   4c On the Select Plugin Acceptable Objects page, choose device where you want to add the segment, then click *Next*.

   4d Specify the size of the segment, the partition type (such as Linux LVM), click *Create*, then click *OK*.

   4e Click *Save*, then click *Save* again to save your changes.

For information about adding or changing segment managers when you are clustering a shared device with Novell Cluster Services, see "Creating Linux POSIX Volumes on Shared Disks" in the *OES 2 SP2: Novell Cluster Services 1.8.7 for Linux Administration Guide*.

OES 2 SP2 File and Data Locations

B

This section contains information about the general rules and conventions Novell® follows when determining where various data types and program components are stored on the Linux file system.

Where possible, we have tried to ensure that OES 2 SP2 components follow Linux Standard Base (LSB) requirements regarding file location. Efforts to do this are detailed here.

B.1 General Rules

Where possible, product design has followed these rules:

- **`/opt/novell`:** Contains all static data in the following standard subdirectories.

`/opt/novell/bin`	Executable files that are used by multiple products or are intended to be executed by an end user.
`/opt/novell/`*`product`*`/sbin`	Executable files that are used only by a product and are not executed by an end user.
`/opt/novell/lib`	Shared libraries that are used by multiple products and shared or static libraries that are part of an SDK.
`/opt/novell/include`	Header files for SDKs, typically in a product subdirectory.
`/opt/novell/oes_install`	The OES installation and uninstallation code.

- **/etc/opt/novell:** Generally contains host-specific configuration data.

  If a product has a single configuration file, it is named *`product or service`*`.conf`.

  If a product uses multiple configuration files, they are placed in a subdirectory named for the product or service.
- **/etc/opt/novell/*service_name*:** Contains various OES service configuration files.
- **/var/opt/novell:** Contains all variable data.

  Variable data (data that changes during normal run time operations) is stored in a product or service subdirectory.
- **/var/opt/novell/log:** Generally contains log files.

  If a product or service has a single log file, it is stored in a file with the product or service name.

  If a product or service has multiple log files, they are stored in a subdirectory named for the product or service.
- All files and directories that could not follow the above rules have the prefix *novell-* where possible.

B.2 Exceptions

Some files must reside in nonstandard locations for their products to function correctly. Two examples are init scripts, which must be in `/etc/init.d`, and cron scripts, which must be in `/etc/cron.d`. When possible, these files have a `novell-` prefix.

When standard conventions preclude the use of prefixes (for example in the case of PAM modules, which use suffixes instead of prefixes), the standard conventions are followed.

Setting Up an Installation Source on NetWare

C

Complete the instructions that follow to set up an Novell® Open Enterprise Server (OES) 2 installation source on an existing NetWare® 6.5 server.

C.1 Prerequisites

You need the following:

- ❑ A NetWare 6.5 server accessible on the network where you plan to install the OES 2 SP2 servers with the following:
  - 6 GB free disk space on the server
  - The Apache Web Server for NetWare installed and running
- ❑ The following ISO image files from Novell:

  These will set up installation sources for both i386 (32-bit) and x86_64 (64-bit) servers. If you plan to install only one of the platforms, then you need only the images associated with that platform.

Image File	Purpose
`SLES-10-SP3-CD-i386-GM-CD1.iso`	Boot CD for i386 (32-bit) SLES 10 SP3 installations
`SLES-10-SP3-CD-x86_64-GM-CD1.iso`	Boot CD for x86_64 (64-bit) SLES 10 SP3 installations
`SLES-10-SP3-DVD-i386-GM-DVD1.iso`	Install source for i386 (32-bit) SLES 10 SP3
`SLES-10-SP3-DVD-x86_64-GM-DVD1.iso`	Install source for x86_64 (64-bit) SLES 10 SP3
`OES2-SP2-i386-CD1.iso`	Install source for i386 (32-bit) OES 2 SP2 services
`OES2-SP2-x86_64-CD1.iso`	Install source for x86_64 (64-bit) OES 2 SP2 services

For information on downloading these image files, see the Novell Open Enterprise Server 2 Download Instructions (http://www.novell.com/documentation/oes2/esd/di_oes2_sp2.html).

C.2 Copy the Files and Mount Them as NSS Volumes

The following instructions create unrestricted access to OES 2 SP2 installation files on a NetWare server on your network. Restricting access to the installation files requires additional configuration through Apache Manager or manual editing of the Apache configuration files.

For more information on restricting access, see information about the Options, Order, Deny, Allow, and other directives on the Apache.org Web Site (http://httpd.apache.org/docs-2.0/mod/directives.html).

To provide unrestricted access to the OES 2 SP2 image files, do the following:

1. Create a directory at the root of a server volume with at least 6 GB of free disk space.

   For example, you might create a directory named `OES2_INSTALL` in a volume named TOOLS.

2. Restrict access to the directory to only those administrators who copy image files to the directory.

   This is important because if someone attempts to access these files after they are mounted as NSS volumes, the volumes are immediately dismounted and no longer available.

3. Copy the DVD image files listed in "Prerequisites" on page 225 to the directory you just created.

4. At the server console, mount each image file as an NSS volume.

   4a Enter the following command:

   `nss /MountImageVolume=`*`volume`*`:`*`directory`*`/`*`filename`*`.iso`

   where *volume* is the NSS volume name, *directory* is the directory you created in Step 1, and *filename* is the name of the ISO file.

   Continuing the example, you might enter the following:

   `nss /MountImageVolume=TOOLS:OES2_INSTALL/`SLES-10-SP2-i386-DVD1.iso

   4b Note the assigned volume name.

   For the first SLES DVD you mount (either 32-bit or 64-bit), the name is `SLES10SP_001`, which is the actual volume name in the image file. For the second image you mount, the assigned name is CD_*followed by a four-digit number*, starting with 0000.

   The same principle applies to the OES 2 SP2 image files. The first file mounted is the actual OES 2 SP2 volume name, but the second image is assigned a *CD_xxxx* name.

   Knowing which volume is for which platform is critical as you create an access URL to the volume in Apache Manager.

5. In a supported browser, start Apache Manager by entering the following URL:

   https://*server_ip_address*:2200/apacheadmin/login.jsp

   Replace *server_ip_address* with the IP address of the NetWare server.

6. Log in as the Admin user or a user with administrative rights to the Apache server.

7. Click the *Content Manager*  icon.

8. Click *Additional Document Directories*.

9. In the *URL Prefix* field, specify an alias name you want people to use to access one of the mounted volumes.

For example, if you are mounting the volume with the SLES 10 i386 installation files, you might name the alias, `sles10sp1-i386`.

10 Click the *Search* icon next to the *File Path* field.

11 Click the volume name that matches the alias name you specified in Step 9, then click *Finish*.

For example, if `CD_0001` is the volume name that NetWare assigned to ISO image of the SLES 10 i386 installation source, then you would click `CD_0001`.

12 Click *Save* > *Save and Apply* > *OK*.

The path to the volume is added as an additional document.

13 Repeat from Step 9 for the other three volumes.

All of the ISO files are now available for access through the Apache Web Server running on the NetWare server.

C.3 Create the Boot CDs

See Section 3.2.2, “Preparing Physical Media for a New Server Installation or an Upgrade,” on page 42.

Documentation Updates

D

To help you keep current on updates to the documentation, this section contains information on content changes that have been made in this guide since publication for the FCS release.

This document is provided on the Web in HTML and PDF, and is kept up to date with the documentation changes listed in this section. If you need to know whether a copy of the PDF documentation you are using is the most recent, check its publication date on the title page.

November 2009

Section	Change
Section 2.4, “eDirectory Rights Needed for Installing OES,” on page 18	Reworked and updated information.
Section 2.5, “Installing OES As a Subcontainer Administrator,” on page 19	Reworked and updated information.
Section 5.4.5, “Upgrading Using the Patch Channel (Online),” on page 122	New section.
Chapter 12, “Upgrading NetWare on a Xen-based VM,” on page 207	New section moved from the NetWare Installation Guide.
Appendix A, “Installing with EVMS as the Volume Manager of the System Device,” on page 213	Removed manual EVMS instructions.